

## **CHAPTER 1**

### **INTRODUCTION**

#### **Definition of Comprehensive Plan**

A land use plan is generally considered to be the most important aspect of a larger Comprehensive Plan. However, before the concept of a "Land Use Plan" can be discussed, it is necessary to define what is meant by "Comprehensive Plan". The specific content, time frame, and actual use of the plan may vary, but a review of pertinent literature on this subject suggests several recurring themes and perceptions.

First, the plan provides a general, broad overview of the physical development of the particular geographic area being studied, typically a political jurisdiction. In this sense, the plan reviews the past development patterns of an area which have led directly to present conditions. Secondly, the plan provides a long range, futuristic view (usually ten to twenty-five years) of how the study area should develop or redevelop. In this respect, the plan examines past trends and utilizes various analytical planning techniques to determine desired future scenarios (it should be noted however that past trends do not necessarily dictate future goals). Simply stated, the Comprehensive Plan depicts where a particular community has been, where it is presently, where it wants to go, and how it plans to get there.

#### **Justification for Comprehensive Plan**

The question often arises, "What is the need for such a document or why have a Comprehensive Plan?" Without a Comprehensive Plan a municipality has no basic guide or frame of reference to direct future land use decisions. This is not to say that local governments are incapable of carrying out productive planning without a Comprehensive Plan. Sometimes planning efforts are conducted without reference to the plan whether one exists or not; this type of planning is known as incrementalism. Decisions are reactionary, that is, in response to a problem or specific proposal. There is something to be said for the incremental approach since it is impossible to eliminate or predict every crisis. In fact, the incremental approach is at times, the correct approach to a problem. However, by itself, incrementalism is extremely limited in its capacity to address major or long-range policy issues.

This type of planning may distort the larger view that is sometimes needed to address an issue. It also makes it very difficult to get the appropriate municipal departments to coordinate their efforts or at a very minimum, to be thinking along the same lines.

## **Content**

The content of the Comprehensive Plan can vary, but generally contains information and analysis of the various functional service sectors of a municipality. The Rhode Island Comprehensive Planning and Land Use Regulation Act requires nine elements: goals and policies, land use plan, housing, economic development, natural and cultural resources, services and facilities, open space and recreation, circulation and implementation. The Warwick Comprehensive Plan adds a tenth element, addressing historic preservation issues.

The Land Use Plan concentrates on land use issues, although there may be an occasional overlap into other areas. It is important to remember that the Land Use Plan is only one element of the Comprehensive Plan; albeit perhaps the most extensive and important of any of the element studies.

## **Process**

The Comprehensive Plan is not an end product and should never be viewed as such; it is a continuing process that needs ongoing refinement and review. The process can best be described as evolutionary, flexible, and able to accommodate change when needed. While a common link or strategy should exist between each element of the Comprehensive Plan, each element should be able to stand on its own. To reiterate the Comprehensive Plan and each element thereof, will remain relevant and useful only when the comprehensive planning process continues as an ongoing municipal function.

## **Legal Basis**

A discussion regarding the legal basis for comprehensive plans or the comprehensive planning process must include references to state law, and applicable local regulations. Title 45, Chapter 22.2, entitled the Rhode Island Comprehensive Planning and Land Use Regulation Act requires all municipalities to prepare a comprehensive plan. It stipulates that the local plan shall enumerate community goals and policies for land use and other functional sectors and that the plan should conform to the applicable State Guide Plans.

Chapter 45-24 of the General Laws prescribes rules and regulations for zoning ordinances. Section 45-24-30 requires that zoning regulations, "...be developed and maintained in accordance with the comprehensive plan... in accordance with chapter 22.2..." Likewise it is important to note that any zoning decisions rendered by the Planning Board as well as the City Council and Zoning Board, must be in conformance with the Comprehensive Plan. Section 45-23 of the General Laws, which regulate subdivisions control also requires that local subdivision

regulations be in accordance with the Comprehensive Plan. In sum, it is apparent that Rhode Island's General Laws and Warwick's corresponding regulations require a comprehensive plan.

The Planning Act, Zoning Act, and Development Review Act have fundamentally changed the traditional concept of the comprehensive plan. A review of past Rhode Island Supreme Court cases has shown that the interpretation of the conformance aspect with reference to the comprehensive plan was broadly construed to support most legislative actions.

For example in Camara V. City of Warwick, 358A.2d,23, (5/16/76), the City rezoned land along Cowesett and Hardig Roads (Sparrow's Point Apartments) from Residential A-15 to LB/MF (Limited Business/Multi-family). Camara and others filed suit claiming that the change was not in conformance with a comprehensive plan. In Camara the Supreme Court found that while the City did not have a formal comprehensive planning document, it did have a comprehensive scheme or formula of zoning. As a result, the true test of conformance became whether or not a change, "...bore a reasonable relationship to the public health, safety, and welfare."

The Planning, Zoning, and Development Review Acts have altered the legal concept of the comprehensive plan. The Zoning Act and the Development Review Act now require that local ordinance and land use decisions be consistent with a municipalities comprehensive plan. Further, the comprehensive plan is now defined under Rhode Island General Law. The result of this action is that Rhode Island has formally adopted the consistency doctrine by statute.

The consistency doctrine has redefined Rhode Island land-use law. There now must be a clear relationship between zoning and subdivision ordinances and the comprehensive plan. The comprehensive plan being that plan, which is defined by the Rhode Island Comprehensive Planning and Land Use Regulations Act. As a result, the municipal comprehensive plan will now become an important legal tool in the adoption of and challenges to zoning and subdivision ordinances and land use decisions that are made under these ordinances.

### **A Land Use Plan for Warwick**

The traditional Comprehensive Plan or any element of the larger plan, such as land use, has usually taken a ten to twenty-five year outlook. For this reason, the Comprehensive Plan has often been criticized as impractical. I. Michael Heyman, Professor of Law, has argued, "... that long-range (end-state) master plans have little demonstrable impact on development because it is extraordinarily difficult to foresee changes in technology, economic conditions, and the like over a long period of time."<sup>1</sup> It would seem that the long-range approach is not particularly realistic

and that it bears little relationship to day-to-day activities and problems.

The issue then becomes how to make the Comprehensive Plan more relevant and useful. There has been a great deal of literature devoted to this subject. Noted planning author, Martin Myerson has called for a more middle-ground approach. He claims that the void between incrementalism and the long-range Master Plan, "... can be bridged by the preparation of short-run plans, of five to ten years in time span." <sup>2</sup> The City advocates the five-year plan as the optimum time frame for the Land Use Plan. In a world of rapid change, as Myerson and others have noted, a longer time frame would lose touch with reality. As discussed earlier, the plan must be updated every three to five years. In this sense, the plan remains relevant and evolves as the needs of the city change. This shorter time frame would also make the plan more relevant as it is passed onto new administrations, planning and zoning boards, planning departments, and other interested city departments.

Aside from the time frame and the actual content of the City of Warwick's plan, another major issue needs to be addressed. Since zoning was first adopted by the city in 1930, there has been no Comprehensive Plan. The ordinance has undergone a number of changes since initial enactment, but these revisions have often been in reaction to perceived changes and needs. Passage of a new ordinance or amendment has translated into instant policy, whether intended or not. Instead of a comprehensive approach to change or a setting of policy beforehand, the city has utilized a piecemeal, crisis-oriented approach to land use issues. This criticism is not a new one and has been addressed on one level or another in past studies.<sup>3</sup>

Simply stated, the City of Warwick, for the most part, has developed in a haphazard fashion without the benefit of an overall Comprehensive Plan. Land use decisions by the City Council and Planning and Zoning Boards, whether right or wrong, have rarely considered the larger view. As a result, some have argued that planning department guidance has been limited and general enforcement of weak and confusing land use regulations has been lacking. In short, there have been few, if any, standards of measure and there has been vague policy direction. It is proposed that what is needed, as much as a Comprehensive Plan or new or revised regulations, is a rethinking of land use development philosophy. Warwick is a mature, highly developed, and complex suburban community, which is under intense land use pressure. There is a chance to accommodate additional growth and redevelopment of existing parcels, but how to go about this will be of great significance. It is time to reflect on the past, carefully consider the future, and then proceed in a new direction with this meaningful and guiding land use policy. The city as a whole must be considered when deciding land use issues. Land use decisions, which continue to

consider only the parcel in question, are not in the City's best interest. If the City's regulations are ineffective or outdated, then they should be changed. However, the City's regulations should first be based on a Comprehensive Plan that will articulate necessary policy direction. The articulation of these rational, comprehensive policies is the goal of this study.

### **General Goals and Objectives**

To further elaborate on the purpose of this plan, the overall goal can be stated as follows: To implement and adopt this five-year Land Use Plan which will define land use policy and guide land use decisions. To accomplish the stated goal, the objectives of the Plan are:

- To examine past, present, and anticipated future land use trends,
- To make efficient use of available land and proper re-use and expansion of existing land uses (this means to discourage expansion of those uses which are seen as being detrimental to the plan's recommended pattern of development, i.e. high density residential development would be discouraged in coastal areas and in areas lacking public sewers and poor soils for ISDS),
- To protect, preserve and enhance residential neighborhoods and environmentally sensitive areas,
- To rationally accommodate new industrial, commercial, residential and other development,
- To avoid land use mistakes of the past,
- To encourage and promote past, desirable land use practices,
- To stimulate and provide new policy direction and land use techniques,
- To strike a balance between a pro-development policy and an anti-growth policy, and
- To provide a policy statement to serve as a guide and reference for land use issues.

## **CHAPTER 2**

### **HISTORIC DEVELOPMENT PROFILE**

#### **Introduction**

This chapter of the Warwick Land Use Plan will review, in general terms, Warwick's historic development pattern and identify recent development trends in the city. The purpose of this discussion is to provide a basis for understanding the evolution of Warwick's present day land use pattern.

This chapter will review the historic development of the city, with a particular focus on 20th Century development trends.<sup>4</sup> The concluding portion of this chapter briefly summarizes the broad development trends identified and offers some closing remarks about land development and future land use policy.

#### **20th Century Land Use Trends**

In 1900, Warwick had evolved from its colonial beginnings as a series of scattered agricultural and maritime settlements, to a heterogeneous community of 21,316 people.<sup>5</sup> A diverse local economy had developed with factories and textile mills along the waterways in the town, resorts on the bay and agricultural pursuits interspersed throughout. (See Figure 1- Industrial Complexes & Historical Mills).

At this time, these scattered population enclaves were connected by a transportation system of roads and rail (trolleys were installed in the city in the first decade of the 20th century) that is quite similar to that of today. The emergence of this transportation system connecting the mill villages, farms and resorts, has played a major role in shaping the land use pattern in Warwick today. Indeed, developments in transportation have played perhaps the most significant role in influencing Warwick's present day land use profile. As the 20th century began, the Town of Warwick included what is today known as West Warwick. This section of the community was then the most densely settled portion of Warwick and possessed most of the town's industrial base. When West Warwick became a separate township in March of 1913, Warwick lost most of its industrial base, as well as a large portion of its population.

The rate and amount of development that took place in Warwick between founding in 1643 and 1900 was substantial, however, it was not until after 1900 that most of the existing development occurred. Just before the turn of the 20th Century the first wave of suburbanization began in

Warwick. As alluded to, this development was spurred by transportation system improvements. These improvements took the form of the extension of trolley lines through Warwick and the electrification of the Warwick railroad. These developments accelerated the settlement of the northern portions of the city. Easy access to these trolley lines made commuting to Providence fairly easy and inexpensive. This trolley and railway system also improved the accessibility to the resort areas along Warwick's shoreline. As a result the Oakland Beach and Buttonwoods areas experienced much greater levels of development before World War I than had been experienced previously.

Adding to this increased pressure of the suburbanization was the growing popularity of the automobile as a transportation mode. The roadway improvements program undertaken by the State of Rhode Island, beginning in 1901 strengthened this popularity. This trend toward suburbanization of the northern portions of the city continued at a fairly strong rate, up to the onset of the Great Depression. Conversion of summer cottages in Warwick's resort areas to year round status also became a trend during this period. This residential growth was reflected in the growing population of the city. Warwick's population in 1920 was 13,481 persons; by 1930 the population had risen to 23,196, a gain of 9,715 persons over this ten-year period (Note: West Warwick was partitioned from Warwick as a separate township in 1913).

The early suburbanization of the city also triggered institutional development; churches, schools and government facilities were constructed to service these new population areas. Perhaps the most significant institutional development that took place in Warwick during this time period was the establishment of the state airport at Hillsgrove in 1931. Its central position within the city and its development over the years has greatly influenced the land use pattern and economy of the city.

Warwick experienced a good deal of growth between the beginning of this century and the start of World War II. This growth was paralleled by institutional, commercial and industrial development. However, the city remained fairly diverse in its land use character. Warwick consisted of 28,757 people in 1940, yet agriculture was still a significant land use activity within the city. Warwick in 1940 was a city of contrasting land uses, with suburban developments, commercial and industrial uses beginning to fill in the areas between the existing farms, mills and resort villages.

The end of World War II marked the beginning of the second wave of residential in-migration that Warwick underwent in the 20th Century. As was the case earlier, suburbanization was given

its major impetus by changes in the transportation field, particularly the popularization of automobile travel. Augmenting this were the low-cost home mortgage programs initiated by the Veterans Administration (VA), and the Federal Housing Administration (FHA). These programs enabled people of modest income to purchase their own single family dwelling and contributed greatly to the suburban development of cities like Warwick.

The sudden availability of these housing funds stimulated a great deal of speculative construction in the city. Generally, speculative subdivisions were built in large tracts consisting of 50 to 200 homes. In many instances, these new subdivisions consumed agricultural land (Farmland is very susceptible to subdivision due to its semi-improved condition, i.e. cleared, generally flat and usually well drained). These general characteristics that were well suited to farming were also desirable characteristics for single family development.

The trend to single family suburbanization in Warwick continued in strong fashion from the end of the war to the middle 1960's. A large portion of new residents came from the Providence area, their move to Warwick reflecting their desire for a less congested suburban lifestyle. This in-migration can be graphically seen in Warwick's population growth during this period; from 28,757 in 1940 to 43,028 in 1950; 68,504 in 1960 and 83,694 in 1970.

The accelerated suburbanization that Warwick experienced was paralleled by institutional, commercial and industrial development in the city. The institutional development largely consisted of school, library and municipal facility construction. The increased use of the automobile as a means of travel, which did much to foster suburbanization in Warwick, also stimulated commercial growth within the city. Unfortunately, this commercial development tended to string out in strip fashion along the roadways in Warwick. The fact that the city developed from a series of villages with no central business area contributed to this tendency, as new business chose high visibility sites along the primary roads.

Commercial and industrial development in Warwick in the 1960's through the 1980's was again stimulated by developments in transportation. Interstate Route 95 was completed in 1966 and I-295 was completed in 1968. The intersection of these two routes in Warwick became the sites of the Rhode Island Mall (formerly Midland Mall) completed in 1968 and the Warwick Mall completed in 1972. The location of these super-highways was primarily responsible for Warwick's emergence as a regional retail and service center

The location of Metropolitan Life's Regional Headquarters, near Route 2 is indicative of the



access advantage that Warwick derived from these highways. The highways also spurred industrial construction in the city. This is especially evident in the light industrial development along I-95, near Jefferson Boulevard.

Single family development was the predominant type of residential construction in Warwick until mid-1960. After that point, apartment construction substantially increased. Apartment complexes were constructed throughout the city, though generally near locations affording ease of access to major roadways within the city.

In more recent times there has been a slowing of the pace of residential development evident in the 1950's, 60's and early 70's. This can be ascribed to a diminished availability of suitable land within the city, as well as high costs associated with residential building. Consequently, the city today faces development pressures that are different than those of the past.

### **Summary**

This chapter has traced the 20th Century historic development of the City of Warwick. The Warwick of today is a fully developed suburb with a strong service and retail economy and a positive residential character. Vacant land within Warwick is becoming less and less available. At the same time, development pressures from the commercial, industrial and residential sectors are continuing due to the desirability of Warwick as a place to do business and live. As a result, the development and institution of intelligent land use policies is of critical importance, if the city is to maintain its quality of life and amenities. The analytical chapters that follow will endeavor to address this central issue.

### CHAPTER 3 STATISTICAL DATA AND ANALYSIS

Before land use policy can be formulated, it is necessary to examine past and current land use conditions. One of the first and most basic pieces of data to be reviewed is the amount of area different land uses occupy. Equally important is a comparison of past information with present data. Table 1 presents 1972 and 1985 land use by acreage.

**Table 1  
City of Warwick Land Use By Acres, 1972 and 1985**

Use	<b><u>1972</u> (1)</b>		<b><u>1985</u> (2)</b>		<b>% Change 1972 to 1985</b>
	<b>Acres</b>	<b>Percent of Total</b>	<b>Acres</b>	<b>Percent of Total</b>	
One Family	6,668	31.31%	7,133	33.60%	6.97%
Two Family	198	.93	70	.33	(-64.64)
Multi-Family	298	1.40	578 (3)	2.72	93.96
<b>Total Residential</b>	7,164	33.64	7,781	36.65	8.61
Retail Commercial	-	-	733	3.45	-
Heavy Commercial	-	-	734	3.46	-
<b>Total Commercial</b>	976 (4)	4.58	1,467	6.91	50.30
Light Industrial	56	.26	377	1.78	573.21
Heavy Industrial	215	1.01	108	.51	(-49.77)
<b>Total Industrial</b>	271	1.27	485	2.29	78.97
Transp. & Public Utilities	372	1.75	206	.97	(-44.62)
Airport	839	3.94	958	4.51	14.18
Roads	2,967	13.93	3,078	14.50	3.74
<b>Total Transportation</b>	4,178	19.62	4,242	19.98	1.53
Schools	323	1.52	624	2.94	93.19
Public Area/Open Space	688	3.23	715	3.37	3.92
Other Public Buildings	84	.39	106	.50	26.19
Semi-Public	930	4.37	985	4.64	5.91
<b>Total Public</b>	2,025	9.51	2,430	11.45	20.00
Vacant	6,683	31.38	4,826	22.73	(-27.79)
<b>Total Land (5)</b>	21,296	100.00	21,231	100.00	-

## Notes:

- 1 It was assumed that the acreage for each use in 1972 included roads as originally presented in the 1990 Land Use Plan: Warwick, Rhode Island, draft 1976. For comparative purposes, in this Table 1, the acreage for roads has been separated and the acreage for other uses for 1972 data has been proportionally reduced.
- 2 1985 land use data was gathered by using Assessor's records, Building Department and City Plan Department information, the 1985 Polk's City Directory, Warwick, R.I. and selective site visits.
- 3 Includes condominiums.
- 4 The method used in 1972 to calculate acreage for retail and heavy commercial uses could not be verified. As such, it was decided to report a total commercial acreage for that year.
- 5 Due to different methods of calculating land use acreage, there was a slight discrepancy between the amount of total acres reported for 1972 and 1985.

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Source: 1990 Land Use Plan: Warwick, Rhode Island, draft 1976, Department of City Plan (1972 data). City of Warwick, Department of City Plan (1985 data).

## Analysis

The Warwick of 1972 was rapidly maturing suburb. Population growth was continuing at a steady rate (the city had seen 22 percent increase in population from 1960 to 1970).<sup>6</sup> In terms of residential use, single family development remained the predominant residential land use. In fact, in 1972 there were more single family building permits granted than in any previous year since 1965. However, during the late 1960's apartment construction began to have an impact on the Warwick housing market and was becoming a large and increasingly visible land use. This trend was in full swing by the end of 1972 and would continue into 1973. As a percent of total land, vacant land comprised more acreage than any other land use except for residential use. At that time, there were still a fair number of vacant available prime sites.

Commercial land use had just undergone a major transformation with the completion of the "Golden Triangle" (Apex, Warwick Mall and the Midland Mall). Warwick was becoming a major retail market area with regional implications.

Industrial development, in terms of acreage, was generally scattered throughout the city with some concentrations along Jefferson Boulevard, the Airport Industrial Center (Leesona area), and the Warwick Industrial Park area (northeast end of the city off Post Road in Pawtucket).

If Warwick was a rapidly maturing suburb in 1972, it could surely be considered a developed one in 1985. Population growth slowed considerably between 1970 and 1980, increasing only by 4.1 percent.<sup>7</sup> However, while the population boom in the city was coming to a halt, the economy in Warwick was quickly expanding (see the City of Warwick: Economic and Fiscal Trends: 1970-1985 study). As Warwick was establishing itself as a major commercial market in 1972, it today clearly ranks as one of the leading market area in New England as well as Rhode Island. The development of Bald Hill Road serves as the best example of this commercial growth.

As for industry, Warwick continues to expand its industrial base despite a drop off in manufacturing employment. The on-going developments of the Jefferson Boulevard corridor as well as Airport Park (just north of Airport Road) have been prime areas of focus. Today, single family development remains an important aspect of residential construction in the city. Although new single family housing now occurs at about half the rate it did during the mid to late 1960's and the early 1970's. In recent years, building permits issued for condominium units have matched and at times exceeded those granted for single family units.

The first part of this analysis has featured a general overview of land use trends since 1972. The following discussion presents a more in-depth review of these land use changes on a category-by-category basis.

### **One Family**

Single family home development has continued to be the City's largest land user. However, as mentioned earlier, land devoted to the one family home has leveled off somewhat in recent years. For the seven-year period 1973-79, the city issued an average of 207 building permits per year for single family dwelling units.<sup>8</sup> For the six-year period 1980-1985, this average dropped to 111 permits per year.<sup>9</sup> Some of the factors which would account for this trend have been the slowdown in population growth, increased housing costs, and the diminution of available vacant land.

Aside from the occurrences mentioned above, there have been other reasons for the decreased rate of single family home construction. For example, the average family size of Warwick household, as one housekeeping unit, has become smaller. In 1970 there were 3.19 persons per dwelling unit.<sup>10</sup> By 1980 there were only 2.68 persons per dwelling unit.<sup>11</sup> Based on the small rate of population growth since 1980 (population had increased by about 1.5 percent between 1980 and 1985)<sup>12</sup>, it is likely that household size in Warwick is now a little less than 2.68 persons per dwelling unit. As household size has become smaller, there has been increased demand for different types of housing. Alternative housing styles, such as condominiums and apartments, use proportionally less land than single family housing development.

### **Two Family**

Two family dwellings, which comprised about one percent of all land in 1972, consumed only 0.33 percent of all land in 1985. The 65 percent drop in two family acreage from 1972 to 1985 was attributable to several factors (different methods of calculating land use data would account for some of the discrepancy). Noteworthy is the fact that two family structures have often been

located along major traffic arterials. It is along these major road systems that strip commercial development has occurred as well as pressures to expand or fill in these strips.

As a result, the numbers of two family dwellings or sites have been converted to office and retail use. This is especially true along the Jefferson Boulevard corridor. Numerous offices as well as light industrial developments have recently occurred in this area. Several of these sites at one time contained two family uses. It is probable that similar conversions have occurred along Post Road, Warwick Avenue, and other major arterials.

In addition to conversion to commercial and in some cases light industrial use, some two family dwellings have likely been converted to mixed uses (combination of residential and non-residential uses) or possibly expanded into larger unit residential developments. Furthermore, for a period in the early 1970's, there was an anti duplex or anti two-family sentiment among some in the city. This feeling or attitude may have hastened the conversion of some two family units and inhibited new construction of others. This situation has changed with the rise in multi-generational households where grown children are providing semi-independent living arrangements within their homes for elderly parents. Duplex housing has also become popular in that it provides affordable homeownership opportunities for families of moderate income. A homeowner who purchases a duplex can live in one unit and partially offset mortgage payments through leasing of the other unit.

### **Multi-Family**

By the end of 1972, the apartment boom in Warwick was in high gear. Ten years before there was only a smattering of acreage devoted to multi-family use. By the beginning of 1973, there was close to 300 acres of land devoted to multi-family use. Almost half of this total was due to the Cowesett Hills apartment complex along Post Road and the Royal Crest apartments on Centerville Road. Apartments would continue to be built at a somewhat steady rate until the end of 1978.

Condominium development first came on the scene in the city in 1971 with the construction of the Kimberly Village development overlooking Greenwich Bay on Post Road. The City's second condominium development, Narragansett Village in Pawtuxet, was actually a conversion from apartments, which occurred around 1974. Wethersfield Commons located off Jefferson Boulevard, which is the City's largest condominium complex, has been constructed in various stages since the mid-1970 through 1986. Within the past five years, other large-scale condominiums such as Eagles Nest off Major Potter Road, Westgate along Quaker Lane, and

Lockwood on West Shore Road, have all been developed. There have also been several other smaller condominiums, most from conversion of what were once rental apartments.

New condominium development, other than conversions, has accounted for almost half (over 130 acres) of the 280-acre increase in multi-family use from 1972 to 1985. The majority of the 130 plus acres of new condominium development were due to the building of Wethersfield Commons and Eagles Nest. The remaining 150-acres of new multi-family acreage added between 1972 and 1985 can be traced to new apartments. Most of this acreage was consumed by the Villa Del Rio apartment complex adjoining Warwick Mall, the Bayside apartments off Sandy Lane and Warner Brook Drive, and the Sparrow's Point Development at the corner of Cowesett Road and Hardig Road.

The city can expect more development pressure to build multi-family housing within the next five years, particularly from condominiums. This can be attributed to several factors such as the increasing desire for alternative housing styles and the City's thirty-nine miles of coastline, which will likely attract many developers and buyers. However, as a multi-family use, condominiums will need careful planning and regulation due to the potential for sewerage, traffic and density problems as well as others.

On the other hand, very few apartments have been built in the city in the past five years. Although the population has stabilized, the city will have to determine appropriate housing policy in light of this trend (the subject of a future study).

### **Commercial**

In 1972, the city contained close to 1,000 acres of commercial land use. Although the method used to classify different commercial uses in 1972 could not be documented, a general category breakdown was determined by using building permit data. As such, it is roughly estimated that in 1972 at least 550 to 600 acres were devoted to retail use. The remaining 375 to 425 were heavy commercial acreage (the heavy commercial category generally included offices, motels, services, automotive repair shops, wholesale operation, and commercial operations which include outdoor storage).

Most of the very substantial increase in commercial acreage since 1972 can be attributed to heavy commercial usage, especially office development. At first glance, it might appear that most of the increase should be because of retail activity. Upon closer examination, it can be noted that many of the larger retail stores (and land uses) were built by 1972. Indeed, at that

time Warwick Mall, Midland Mall (now Rhode Island Mall), Ann and Hope, Apex, and the Warwick Plaza were all located in the city. These stores occupied about 170 acres.

Since 1972, retail employment in the city has steadily grown (see the City of Warwick, Economic and Fiscal Trends: 1970 - 1985 study). New retail land use (acreage) has occurred on a large scale along Bald Hill Road, as well as on smaller parcels and in-fill sites along other major roads. The significant increase in retail employment can be traced to both new retail land use (acreage) and especially expansion of existing retail sites (in terms of building additions or increase in the number of employees at a given store).

It is important to recognize the aforementioned distinction. The City's retail employment sector has grown at a rapid pace and some indications are that it could continue to do so. In terms of new acreage devoted to retail use, the increase has not been as dramatic. All alluded to earlier, a good portion of the increase in heavy commercial acreage has been the direct result of new office development. A sizable portion of this acreage (about 100 acres) was consumed by Metropolitan Insurance Company along Quaker Lane. There have been numerous other office developments, particularly along Centerville Road, Jefferson Boulevard, Tollgate Road, Post Road, and other major arterials. As seen in the Economic and Fiscal Trends study, there has been a significant increase in service employment. Much of this development has been from new or conversion to business service and to a lesser extent health service office uses (It should be noted that future updates of the Land Use Plan should categorize office use separately).

## **Industrial**

Total industrial land use (acreage) increased by a healthy 80 percent between 1972 and 1985. Unfortunately, it was not possible to determine how industrial use was further classified (in 1972) into light and heavy categories. As a result, certain assumptions were made in order to explain the changes in these categories from 1972 to 1985.

In 1972 there were 271 acres of industrial land in the city. Of this total only 56 acres were classified as light industry and the remaining 213 acres as heavy industry. It was assumed almost all industrial entities at that time were placed in the "heavy" category. In fact, it is now maintained that today (1986), there is very little heavy industry in the City of Warwick.

Heavy industrial use would include sand and gravel operations, salvage industries, rendering plants, and generally extractive industries. There are currently fewer acres devoted to sand and gravel operations than there were in 1972 and less heavy industrial uses in general. The decrease

in land used for heavy industry then is because of two factors: fewer sand and gravel operations and the undetermined method used to classify industrial land in 1972 (which apparently lumped most industrial use into the heavy industry category).

On the other hand, land devoted to light industrial use has significantly increased. However, as mentioned, this increase is somewhat exaggerated by the fact that in 1972 very little industrial use was classified as "light". The majority of new acreage attributed to light industrial use has been located in the Jefferson Boulevard area north of Airport Access Road extending to the Cranston line. Another area of concentration has been the Airport Park vicinity north of Airport Road (also known as Occupasstuxet Road). Most of the new light industrial operations (since 1972) have been storage, electrical instrument manufacture and repair, and the manufacturing of jewelry.

As reported in the City of Warwick, Economic and Fiscal Trends: 1970-1985 study, manufacturing employment in the city declined between 1980 and 1985. On the surface, this recent decline in manufacturing employment would tend to contradict the increase in light industrial acreage. However, upon closer examination it should be noted that many manufacturing plants are not as labor intensive as they once were due to automation. It should also be recognized that some manufacturing firms now devote space to research and development that would eliminate a number of production workers. As such, while there may be less manufacturing workers (since 1980) the city has not declined in acreage devoted to industrial usage. In fact, as stated earlier, the city witnessed about an 80 percent increase in industrial acreage from 1972 to 1985.

### **Transportation and Public Utilities**

The 166-acre decrease in transportation and public utility land has proven difficult to explain. Once again, it was not possible to determine what uses were placed in this category in 1972. However, one major discrepancy was discovered. It appears that a 58-acre site off Buttonwoods Avenue was erroneously classified (in 1972) as transportation and public utility land. The WARV radio station leases a small portion of this lot for its tower, but the site is primarily used for residential use. The site was properly classified as residential in 1985.

Unfortunately, there were still over 100 acres that could not be accounted for. It was assumed that this discrepancy could be attributed to different classification methods. In actuality, aside from the 58-acre error, total transportation and public utility acreage has changed very little since 1972.



**Airport**

Airport land has increased by over 100 acres since 1972. Most of this increase has been the result of the State's acquisition of land off Warwick Industrial Drive and land south of Main Avenue (known as the Airport clear zone). The 1985 total of 958 acres included vacant State holdings abutting the active areas of the airport now in use.

**Roads**

Acreage from roads increased by 111 acres between 1972 and 1985. Most of the increase was due to new roads from residential development (new subdivisions). The construction of the Post Road connector in Apponaug and the Airport Access Road linking Jefferson Boulevard with Interstate 95 accounted for the remaining acreage increase.

**Schools**

Acreage devoted to schools increased significantly between 1972 - 1985. Most of the 300 acre increase was due to the building of two major educational facilities; the City's Tollgate complex off Tollgate Road and Commonwealth Avenue, and the Community College of Rhode Island (formerly Rhode Island Junior College) off East and Commonwealth Avenues.

A number of city schools have closed since 1972 such as the Lockwood, Natick, Lincoln Park, and Central Schools. This loss of school acreage has been somewhat offset by the new development of private (business) schools including New England Tech along Post Road near the Airport and the Sawyer Business School on Warwick Avenue near Pilgrim High School.

**Public Area/Open Space**

Public area/open space acreage, which includes city or state owned recreation sites, changed very little from 1972 to 1985. This occurrence would seem to be consistent with the fact that the City's population has increased very slowly since 1970. Other factors, which have precluded the development of new recreation acreage, have been limited acquisition funds and lack of available sites.

**Other Public Buildings**

The "other public buildings" category did not change very much due to basically the same reasons the public area/open space category remained somewhat constant. The slight increase in acreage was mainly the result of the building of the new police station in Apponaug and the conversion of a site from office to the Kent County Courthouse along Quaker Lane and Bald Hill Road. The Mickey Stevens Sports Complex near Wildes Corner was also constructed during this

period. However, this development occurred on the existing public work site which would have been classified as "other public building" acreage in 1972. (See Figure 2 - Public Facilities).

### **Semi-Public**

Land devoted to "semi-public" use has had a small increase since 1972. Generally, this category includes golf courses, religious institutions and related facilities, semi-public/semi-private clubs, cemeteries, hospitals, nursing homes and other uses.

Most of the 985 acres listed for 1985 is comprised of golf courses, clubs (such as the Little Rhody Beagle Club off Cowesett Road, the Shriner's property off Long Street, and the Y.M.C.A. at the corner of Centerville and Bald Hill Roads), and religious institutions. Most of the insignificant increase in acreage can be attributed to new religious facilities and nursing homes.

### **Vacant**

Vacant land has obviously decreased substantially since 1972. In terms of acreage, the city was basically about 69 percent developed in 1972 and about 77 percent developed in 1985. Most of the 1,857-acre decrease in vacant land was due to new residential development. There were also important gains in total commercial, public and industrial acreage.

### **Population**

While the City's land use picture was significantly altered during the last fifteen years, the City's population only slightly increased over this period of time. The twenty-year period 1950-1969 could be described as a time of population boom in the city. During those two decades, Warwick's population grew at a rate almost five times as fast as the State as a whole.<sup>13</sup> Since 1970 this trend has completely changed. Table 2 compares the city population with the State of Rhode Island.

**Table 2**  
**Population Increase, Warwick and Rhode Island 1970 - 1984**

<b>Area</b>	<b>1970</b>	<b>1980</b>	<b>% Increase 1970-80</b>	<b>1984</b>	<b>% Increase 1980-84</b>
Warwick	83,694	87,123	4.1%	88,423 <sup>(1)</sup>	1.49%
Rhode Island	949,723	947,154	(-0.27)	963.104 <sup>(2)</sup>	1.68%
Warwick as a % of R.I.	8.8%	9.2%	-	9.18%	

**Notes:**

- 1 This 1984 Warwick Department of City Plan estimate was calculated by using the Rhode Island Department of Health figures for natural increase (resident births minus resident deaths) between 1980-1984 and the estimate yearly average net migration statistics between 1980-1984 (those moving in minus those moving out - it was assumed that the actual yearly average net migration figure for the ten year period 1970-1979 remained constant from 1980-1984).
- 2 This 1984 estimate was made by Statewide Planning, except the Warwick Department of City Plan estimate for Warwick in 1984 was used in the state total instead of Statewide Planning's estimate for the city.

Sources: 1970 and 1980 U.S. Census, City of Warwick, Department of City Plan, Rhode Island Statewide Planning Program, Rhode Island Department of Health.

It is clear that population growth in the city has slackened. In fact, between 1980 and 1984, Warwick's population as a percent of total state population actually decreased. Furthermore, for the first time since 1910, the rate of population increase in Rhode Island grew faster than the same in Warwick.<sup>14</sup>

Another important population change occurred in the breakdown of the two sources of growth; natural increase and net migration. Over the twenty-year period from 1950-1969, approximately 67 percent of Warwick's population gain was from net migration.<sup>15</sup> The following decade, 1970-1979, saw a reversal of this trend.

**Table 3**  
**City of Warwick Natural Increase and Net Migration, 1970 - 1984**

<b>Year</b>	<b>Population Increase</b>	<b>Natural Increase</b>	<b>Percent of Total</b>	<b>Net Migration</b>	<b>Percent of Total</b>
1970-1979	3,429	2,140	62%	1,289	38%
1980-1984	1,298	653	50.3	645 (est.)	49.7

Sources: 1970 and 1980 U.S. Census.

As noted, Warwick in the 1950's and 1960's was quickly establishing itself as a major suburb. Warwick ranked as the fifth largest city in Rhode Island in 1950.<sup>16</sup> By 1970 it has become a second largest city.<sup>17</sup> While growth from natural increase was at an all-time high, most of this population increase was due to net migration. During this time, many former residents of

Providence and other urban areas relocated to Warwick. This trend of rapid suburbanization (moving away from the more urban inner city areas to the suburbs) was generally occurring throughout the Northeast.

The forces that led to the massive migration of the 1950's and 1960's dissipated during the decade 1970-1979. In relative terms, compared to the two previous decades, the 1970's were a time of rising inflation, an energy crisis, and high unemployment. Simply stated, net migration fell way off. The end of the post World War II baby boom also caused a significant drop in natural increase but the leveling off in population was more affected by the slowdown in net migration.

Warwick in the 1970's had become a mature suburb and it was not surprising that most of its small population increase accrued from natural increase. Migration by its very nature, was and is more cyclical, unpredictable, and more easily affected by other factors, such as jobs and housing prices. As such, caution should be exercised when using or interpreting net migration data from 1980-1984 listed in Table 3.

As pointed out in Table 3, the actual yearly average net migration figure for 1970-1979 was used to determine the same of 1980-1984. The actual net migration for the 1970's was 1,289, or an average of 129 per year. The 129 per year average was simply used to estimate that figure for 1980-1984 ( $129 \times 5 \text{ years} = 645$ ).

Most of the net migration from 1970-1979 occurred in the first half of that decade most likely from a spillover effect from the previous decade. As the economy soured in the second half (1975-1979) there was less migration. The 1980's thus far, has seen a return to prosperity and it is likely that net-migration has picked up again. Recent migration (1980-1984) was probably higher than the 1975-1979 period and more or less equal to the 1970-1974 period. It could be argued that the estimate of 645 in-migrants is low. For statistical validity the average of 129 in-migrants a year was used although it is clear that accurate migration figures (for current projects) are difficult to come by.

Another aspect of population that has changed since 1970, concerns age and sex distribution. The table below documents a general aging of the population since 1970 as evidenced by a slowing birth rate and a sharp increase in the number of people over 65 years of age.

**Table 4**  
**City of Warwick Age and Sex Distribution, 1970 and 1980**

	<b>1970</b>			<b>1980</b>			
	<b>Age</b>	<b>Male</b>	<b>Female</b>	<b>Age</b>	<b>Male</b>	<b>Female</b>	<b>Total % Increase 1970-80</b>
Under 5 years	3,295	3,274	6,569	2,525	2,310	4,835	(-26.4%)
5 - 19 yrs	12,881	12,344	25,225	10,735	10,260	20,995	(-16.8)
20 - 44 yrs	11,698	12,789	24,487	14,441	15,255	29,696	21.3
45 - 64 yrs	9,509	10,029	19,538	9,561	10,769	20,330	4.1
65 and over	3,144	4,731	7,875	4,350	6,917	11,267	43.1
Totals	40,527	43,167	83,694	41,612	45,511	87,123	

Sources: 1970 and 1980 U.S. Census.

The increase in the number of elderly people will no doubt have a strong impact on elderly housing needs and related support services for many years to come. The other age categories reflect the overall decline in the increase of population growth. Sex distribution remained proportionally similar to the 1970 data. Composition of the City's population by race has not changed for the most part. As evidenced in the table below the percentage of white and black persons remained basically unchanged between 1970 and 1980.

**Table 5**  
**City of Warwick Population by Race, 1970 and 1980**

<b>Race</b>	<b>1970 Population</b>	<b>Percent of Total</b>	<b>1980 Population</b>	<b>Percent of Total</b>
White	83,167	99.37%	86,161	98%
Black	326	.39	345	.40
Other Races	201	.24	617 (1)	.71

1

Total includes Chinese, Asian Indian, American Indian, Filipino, Japanese, Korean, and races not elsewhere classified.

One category that experienced a major increase was "other races". The 1970 census classified population by race in a very different manner than the 1980 census. As such, it was virtually impossible to document which races have contributed to this change. Our best estimate was that most of the 416 person increase in "other races" was due to the influx of Chinese and other Asian races.

## Population Projections

The following table presents population projections through the year 2010.<sup>18</sup>

**Table 6**  
**City of Warwick Population Projections**

Year	Population
1970	83,694
1980	87,123
1990	85,427
2000	93,810
2010	100,886

1 As part of the development of the Land Use Element of this municipal comprehensive plan, the City's consultant undertook a buildout analysis of Warwick's undeveloped and underdeveloped land. Using the land consumption figures derived from the buildout, it was possible to estimate the future population of Warwick. Statewide projections for persons per household were multiplied by the projected number of lots to be developed in the city in a ten-year period resulting in the projected population increase for that decade. A constant person per household figure of 2.3 was assumed beyond the year 2010. The median yearly figure for natural increase over the last 9 years was 133 people. An adjusted figure for natural increase was added to the total population increase. Also considered was Warwick's large supply of entry level housing that serves as an attraction to the region's newly forming households who are seeking that first house.

Sources: U.S. Census of Population, 1970-1990. Buildout analysis, Albert Veri & Associates, 1991.

The following table presents data on the type and number of year round dwelling units in the City in 1980, 1985 and 1990.

**Table 7**  
**City of Warwick Type and Number of Year Round Dwelling Units, 1980, 1985 and 1990**

Type	1980	1985	1990	% Increase 1980-85	% Increase 1985-90	# Increase 1980-90
One Family	24,652	25,255	26,414	2.4%	4.6%	1,762
Two Family	1,573	1,599	1,537	1.7%(1)	-3.9%	-36
Multi-Family	5,719	6,747	6,770	18.0%(2)	0.2%	1,051
Mobile Home or Trailer	137 <sup>(3)</sup>	137	420	0	206%	283
<b>Total</b>	<b>32,081</b>	<b>33,738</b>	<b>35,141</b>	<b>5.2%</b>	<b>4.1%</b>	<b>3,060</b>

Notes: 1 Number of new dwelling units authorized by building permit minus units razed.  
 2 Number includes new apartment and condominium units authorized by building permit minus units razed and as such, not those units, which were converted from apartments to condominiums.  
 3 Based on the tax assessor's records, the city had the same number (137) of mobile home units in both 1980 and 1985. Therefore, it was concluded that the 1980 Census claiming 90 mobile homes was in error.

Sources: 1980 U.S. Census, City of Warwick, Department of City Plan; Department of Building, & Tax Assessors Office.

The data presented in Table 7 generally reflects the land use trends depicted in Table 1 (Land Use by Acres). Single family housing construction continued to be an important part of new residential development but at a decreasing rate (for example, about twice as many single family units were authorized during the previous six year period, 1974-1979). While there was a minor increase in the number of two family dwellings between 1980 and 1985, this trend had reversed itself by 1990 with a 3.9 percent decrease.

In the first half of the decade, the largest percentage increase in dwelling units could be attributed to multi-family development. Of the 1,028 unit increase, 510 units were new condominium units and 518 units were apartments (of the total 6,747 multi-family units in the city in 1985, 1,139 were condominium units).<sup>19</sup> It was noteworthy that during 1984 and 1985 only 40 apartment units were authorized by permit.<sup>20</sup> The second half of the 1980's saw a significant shift in development patterns marked by a significant decline in the number of multifamily units constructed contrasted with an increase in the rate of single family housing construction.

The total number of year-round dwelling units presented in Table 7 includes the number of vacant year-round units. In 1980, the U.S. Census reported that there were 1,075 vacant year-round units. It is necessary to point out that this total represents all vacant year-round dwelling units under construction, for sale or rent, or actually vacant at that time. The City of Warwick, Department of Building, Division of Minimum Housing reports that in 1985 there were approximately 150-200 actual vacant year-round units (part of this information is based upon data gathered by the City of Warwick Fire Department). The decrease in actual year-round vacant units since 1980 can be traced to demolition, units becoming occupied during that time, and the different methods of calculating "vacant" year-round units.

The data presented in Table 7 does not include the number of seasonal dwelling units. The 1980 U.S. Census claimed that there were 416 such units. The Division of Minimum Housing confirms that the total was more or less accurate. In addition, they report that the number has not changed very much since 1980.

### **Commercial and Industrial Construction**

As pointed out in the "land use by acreage" section in this chapter, there were healthy increases in the acreage devoted to commercial and industrial usage. Another measure of this type of non-residential building activity is the amount of gross floor area added. The table below presents this information for the years 1980 through 1985.

**Table 8**  
**Non-Residential Gross Floor Area Added, 1980 - 1985 <sup>(1)</sup>**

<b>Year</b>	<b>Commercial Square Footage</b>	<b>Industrial Square Footage</b>	<b>Total</b>
1980	166,746	82,644	249,380
1981	117,250	36,760	154,010
1982	218,492	1,800	220,292
1983	177,222	63,580	240,802
1984	406,595	93,912	500,507
1985	618,593	139,117	757,710

1 Includes new non-residential gross floor area and additions to existing buildings authorized by building permit.

Source: City of Warwick, Building Department, compiled by the Department of City Plan.

1984 and 1985 were banner years in terms of non-residential construction. There was more commercial floor area authorized by building permit in 1985 than in any year since 1969. Of the total 1,025,188 square feet of commercial floor area added in 1984 and 1985, the following breakdown can be observed.

**Table 9**  
**City of Warwick Type of New Commercial Space, 1984 and 1985**

Retail	466,509
Office	347,290
Other <sup>(1)</sup>	211,389
Total	1,025,188

1 Includes mostly commercial storage and warehouses, automotive repair and sales.

Source: City of Warwick, Building Department, compiled by the Department of City Plan.

As far as industrial development is concerned, more floor area was added in 1985 than in any year since 1978. Most of the total 233,029 square feet of industrial floor space added in 1984 and 1985 (see Table 8) was industrial storage, warehousing, and manufacturing.

## Summary

The following basic summary trends can be observed with regard to recent land use patterns and expected development progression. Warwick is still primarily a residential city as 47.4 percent



of its developed land was in residential use (in 1985). Of the remaining approximately 4,800 acres of vacant land, about 4,000 acres are currently zoned for residential use.

Single family homes are not being built at the rate they once were but still comprise an important part of the new residential construction. During the last six years most of the traditional detached single family home subdivisions have been located in the Cowesett area (the area generally south of Centerville Road to the East Greenwich line bounded on the east by Post Road and on the west by Interstate Route 95).

Future (next five years) single family housing construction will likely continue in the Cowesett area and in the southwest quadrant of the city (the area generally south of Centerville Road extending to Interstate 95 bounded on the west by Bald Hill Road/Quaker Lane and on the east by I-95). To a lesser extent, in-fill single family housing is likely to occur throughout the city as it has during the last six years (1980-1985).

The increased condominium construction of the late 1980s led to a glut and eventual collapse of the condo market. This collapse was hastened by Rhode Island's banking crisis in 1991, which resulted in many half-completed bankrupt developments around the state. With the resolution of the banking crisis, and the absorption of surplus condo units, development has resumed at a modest rate. Developers are building again, but now construction is largely of pre-sold rather than speculative condo units.

The forces that led to increased condominium development, as discussed earlier (use proportionately less land than traditional single family housing, potential for greater profit, ease of converting existing apartments, and increased popularity and demand for alternative housing styles) were counteracted by a glut of construction in the latter half of the 1980s and the credit union crisis which resulted in a drying up of investment capital in 1991 and 1992. With the absorption of excess inventory and the resolution of the banking crisis, there has been a renewed interest in condominium development. The present development differs from that experience during the 1980s in that the earlier development was speculative in nature while present development is largely of the pre-sold variety. Since most apartment developments are located along major arterial roads in the city, it is these locations where future conversions to condominium use will take place. This will probably be the case for some apartments that now afford good access to major road systems and shopping areas. In addition, those sites that overlook the Bay are potentially ripe for conversion.

New condominium construction will likewise happen in those areas that can provide the

amenities discussed above. Areas that the development community could find desirable are Warwick Neck, Potowomut, Gaspee Point, Buttonwoods, and in-fill sites in Conimicut, Oakland Beach and along Post Road south of Apponaug to the East Greenwich line. In-fill vacant sites away from the coast will also be considered. No doubt, how, where, and if these developments occur will be of great interest to the established local neighborhoods and other interested parties.

While condominium construction and conversion has boomed, the short-range future for apartment construction does not look bright. As such, a separate Housing Element Study is needed to address this important issue and the subject of housing policy in general.

Commercial development since 1980 has mainly consisted of retail and office use. As would be expected, most of the development has been constructed along the City's major arterials or within easy access to such road systems. Retail development has been concentrated along Bald Hill Road, Post Road, Greenwich Avenue, Lambert Lind Highway, West Shore Road, Warwick Avenue, Quaker Lane, and Buttonwoods Avenue. It is obvious that future retail developers will attempt to locate along these and other major arterial roads. Office development has clustered along the Jefferson Boulevard corridor, Centerville Road, Post Road, Quaker Lane, West Shore Road, and Tollgate Road. Expected future office users, like retail developers, will naturally seek these locations and other major roads. The land use policy put forth in this document will attempt to carefully balance neighborhoods and environmentally sensitive areas.

Industrial development appears to be back on the upswing especially during 1984 and 1985. By and large, new development since 1980 has been concentrated in the Jefferson Boulevard corridor and vicinity (particularly the Service Avenue, Plan Way, and Access Road area, and Metro Center), and the Airport Park area. There have also been some concentrations, to a lesser extent, in the Gilbane and Meadow Street areas in Apponaug and the Pontiac Mills area in Pontiac.

Future industrial developers will, no doubt, look for areas with good location, access, and infrastructure (sewer, water, gas and electricity). It is likely that the aforementioned areas will continue to grow especially the Jefferson Boulevard corridor and the Airport Park area. Other sites in Apponaug and Pontiac, the Airport Industrial Center (old Leeson area off Warwick Industrial Drive), and the Warwick Industrial Park in the Pawtuxet area still afford some opportunities. As with commercial development, this plan will attempt to accommodate needed industrial growth while minimizing any potential conflicts with residential neighborhoods and other sensitive areas.

## **CHAPTER 4**

### **NATURAL DEVELOPMENT CONSTRAINTS AND OPPORTUNITIES**

#### **Introduction**

The purpose of this chapter is to describe and analyze the City's physical features and environmental systems as they affect each other and land use in Warwick. The analysis to follow will identify and describe land-based resources of the city; Warwick's water based resources, the interrelationship between these resource systems, and provides a summary of the land use opportunities and constraints presented by these environmental characteristics. It should be noted that due to the close interrelationship between land and water resources, some characteristics will be discussed under both of the major headings identified above.

#### **Topography and Slope**

Warwick is essentially divided into two topographic distinct areas. The first of these is a seaboard lowland area in the north and central areas of the city and Potowomut. The second is an upland character located in the western and southwestern portions of the city. A pronounced escarpment or steep slope separates these two areas. Figure 3 illustrates these two basic topographical characteristics of the city.

Warwick's lowland area is fairly flat ranging in altitude from sea level to an elevation of about 100 feet. There are, however, several hills are present in the lowland area, most notably on Warwick Neck, the highest point of which is approximately 140 feet above sea level. Along portions of Narragansett and Greenwich Bay, the lowness of the terrain makes it susceptible to flooding and wave damage during severe storms or hurricane events. This characteristic poses a considerable constraint to development in these flood prone areas. In addition, throughout the seaboard lowland area are scattered ponds of various sizes and depressions. Many of these areas are also susceptible to flooding during severe storm occurrences. The flood storage character of these areas is a constraint to development, yet these areas are valuable as a natural flood control mechanism. Encroachment on these flood plain areas can diminish their flood holding capability and cause considerable problems.

The other distinct topographic area in the city is the upland area, which consists of a series of hills separated by stream valleys. The Cowesett area comprises a large portion of this upland area. Much of the undeveloped portions of this area are heavily wooded. The highest point in the city, Spencer Hill (Elevation 350-feet) is in this upland section of Rhode Island Route 2 (Bald Hill Road), north of Major Potter Road.

Slopes in Warwick are for the most part gentle to moderate. In general, slopes greater than 15 percent are considered to be a severe constraint to development. Slopes of this magnitude are fairly rare; where they do occur, however, they are most frequently found in Cowesett, Bald Hill, Pawtuxet River (western portions), and Warwick Neck areas (See Figure 4). For the most part, slope conditions in the city are not a severe constraint to development, with the exception of the excessive slope areas.

### **Wildlife<sup>21</sup>**

In a developed suburban setting such as Warwick, most of the native wildlife has disappeared or dwindled to very low populations. There are, however, areas in the city that support wildlife, primarily birds and aquatic life forms. The most important of these areas are the City's wetlands, salt and freshwater marshes, streams, ponds and Narragansett Bay. Marshes, in addition to being a source of flood control and water resource management, provide excellent sources of food and shelter for aquatic life, birds and waterfowl. Upland woodland, particularly in the south western sections of the City which remain undeveloped provide valuable habitat for fox, deer and a wide variety of more commonly observed mammals and birds.

All of the City's wetlands are valuable wildlife habitats, however several are considered to be of outstanding value for "providing unique ecological habitats in a highly developed area." <sup>22</sup> The highest ranked wetland on this list is the Buckeye Brook and its associated wetland areas. The brook provides a means for herring to "run" upstream each spring to reach spawning grounds in Warwick Pond. The salt marshes at Mill Cove support a large and diverse group of aquatic life and are excellent shelter for ducks.

The following table lists the major wildlife habitat areas within the city. The list, however, is not exhaustive or exclusive. The locations of these areas are depicted on Figure 5.

### **Soil and Ground Water Conditions**

This section provides a general overview and description of soils present in the City of Warwick. The purpose of this description is to identify the development potential and constraints associated with these soils. This information is based upon soil surveys conducted by the U.S. Department of Agriculture, Soil Conservation Service, and the University of Rhode Island's Agricultural Experiment Station. This data is fairly general in character and while useful for overall land use planning applications, it should not be used to make land use decisions for specific small parcels of land.

**Table 10**  
**City of Warwick Major Wildlife Habitats**

<b>Name</b>	<b>Wildlife Value</b>
Buckeye Brook/Mill Cove	Herring run, aquatic life, wood and black ducks
Warwick Pond	Various fish, snapping turtles
Potowomut River	Herring run
Rock Island	Fossil site, birds
Passeonkquis Cove	Ducks, Scaup, Widgeon
Gorton's Pond	Smelt run, fresh water fish (various types)
Occupasstuxet Cove, Marsh Point, Baker's Creek, Mary's Creek	Waterfowl, shell and fin fish,
Conimicut Point (Narragansett Bay)	Shellfish, salt water fish (various types)
<b>Name</b>	<b>Wildlife Value</b>
Tuscatucket Brook & Pond, Sand Pond, Three Pond Brook, City Park	Waterfowl, freshwater fish
Pawtuxet River (especially lower reaches)	Waterfowl, birds

Sources: The Wetlands of Warwick, Rhode Island, An Ecological Analysis and Evaluation, Ecological Associates, Inc., 1973. Warwick Environmental Master Plan, 1973. RI Dept. of Environmental Management, 1993, inter-office memo, July 10, 1992, Environmental Coordination Division.

Basically, the soils present in Warwick can be classified into two general classes based on their glacial origins and characteristics. These basic characteristics are glacial outwash soils and glacial till soils. As was noted in the discussion of slope and topography, glacial outwash and till deposits are generally found in two distinctive areas. Warwick's eastern lowland and central portions of the city are characterized by outwash soils, and conversely, the western upland areas, are generally composed of till soils. Outwash soils are for the most part well sorted, well drained, sandy and loosely packed. These soils contain the most productive water bearing materials in the city. Till soils are usually tightly packed and poorly drained. Rock outcroppings are commonly found in these soil types. Often till soils are termed "hardpan" soils because of their relatively impermeable character.

Outwash soils, because of their suitability to absorb water or liquid wastes, are usually better suited for development than till soils. However, the good permeability of outwash soils can be adversely affected by the presence of a high water table. The water table is that point in the soil that is completely saturated with water. The areas in Warwick characterized by high ground

water (water table in close proximity to the surface) are generally located along the shoreline in the north, northwest and western parts of the city. Figure 6, Groundwater Conditions, depicts the groundwater conditions in the City of Warwick. Shaded areas indicate glacial outwash areas; the darkest areas having the highest ground water yield. Unshaded areas on the map are indicative of glacial till soils. Areas on the map marked with diagonal lines are areas with a high water table.

### **Soil Constraints for Septic Use**

The 1981 Soil Survey of Rhode Island identifies the presence of fifty-one (51) soil types in Warwick. The manual classifies these soils in a variety of ways. For land use planning purposes, one of the most useful classifications is related to soil suitability for "sanitary facilities." Here, the soil manual rates various soil types according to their ability to accommodate on-site sewage/septic disposal systems.

Soils are classified as having slight, moderate or severe constraints. Soils with slight constraints are well suited for individual septic disposal systems, with minor limitations if any. Those soils classified as having moderate limitations for sanitary facilities possess site features or soil properties that are not favorable for development, but these characteristics can be overcome with special planning and system design.

Soils which are classified as having a severe constraint have soil properties or site features that make the installation of on-site septic system disposal systems extremely difficult, often requiring major soil reclamation, special system design and construction, and intensive maintenance of the systems.

The major soil property that affects these ratings is permeability (the ability of the soil to absorb water). However, other factors that can affect the ability of soil to absorb effluent are: depth to seasonal high water table, excessive slope, depth to bedrock, stoniness and susceptibility to flooding. These factors in addition to permeability were taken into account for this classification system.

In Warwick, the soils with the best permeability are generally associated with the glacial outwash areas. Soils in the northern and central portions of the city are generally classified as having "slight" constraints for the siting of septic fields. These soils are generally level, sandy, loosely packed and well drained. Areas with moderate and severe soil constraints in the northern and central portions of the city are found in the alluvial areas along ponds and streams, wetland

areas, and in some instances, the coastline. Nearly all the soils in the Warwick Neck vicinity are classified as having severe constraints, due to slow permeability, high water table and/or excessive slopes.

The southwest and western portions of the city, primarily Cowesett, Bald Hill and the Spencer Hill areas are generally comprised of soils that have severe and, to a lesser extent, moderate constraints for siting sanitary facilities. Soils in the Cowesett area are characterized by slow percolation, large stones, rock outcroppings and, in some instances, steep slopes.

The Bald Hill area is characterized by stony soils, bedrock outcrops, steep slopes and slow percolation in some areas. The area south of Bald Hill has a mixed soil constraint profile with areas of slight, moderate and severe constraints present. Moderate constraint soils are the largest component of this area, as is true in the city as a whole.

Severe constraints are generally associated with streams, wetlands, and small waterbodies. The Spencer Hill area, south of Cowesett Road to East Greenwich, also offers a mixed soil profile with severe and moderate constraints predominating. Potowomut Neck's soil constraint characteristics are primarily slight and moderate. Severe soil constraint areas are located along the shoreline, especially along the southern side of the peninsula.

Much of Warwick's shoreline is slightly to moderately constrained in terms of soil. Shore areas that are severely constrained include: Gaspee Point, Passeonkquis Cove, Occupasstuxet Cove, Conimicut Point to Warwick Light, and Warwick Light to the head of Warwick Cove. Small areas along Buttonwoods Cove, Greenwich Bay and the southwest side of Apponaug Cove also are classified by the Rhode Island Soil Survey as having severe soil constraints for septic systems.

Soil Limitations, depicts the sanitary facility constraint characteristics of soils in the City of Warwick. It should be noted that in the portions of the city that have sewers, soil constraints are mitigated to a degree. However, even in these areas, the soil ratings previously discussed are useful because they indicate potential problems with permeability, slope, stoniness or other conditions.

## **Water Resources**

Warwick surface water resources are comprised of freshwater and saltwater (coastal) resources. Elements important to land use include drainage, wetlands, floodplains, water quality, and regulation.

## Freshwater Resources

The City of Warwick lies completely within the Narragansett Bay drainage basin. Two major rivers drain the City's land area into the Bay. The two rivers are the Pawtuxet River and the Hunt's (Potowomut) River at the southern boundary of the city.

Water bodies that drain into the Pawtuxet River basin include Three Pond Brook and Cranberry Bog Brook along with several smaller unnamed brooks and streams. The Hunt's River drainage basin empties into Potowomut River and subsequently Narragansett Bay, on the southern side of Potowomut Neck.

There are several local watercourses that do not drain into the two major river basins in the city. These streams drain directly into Narragansett Bay. Included among these streams are the Maskerchugg River and Dark Entry Brook which drain from the Cowesett Area to Bleachery Pond in East Greenwich and then to Greenwich Cove. Hardig Brook, which originates in the Compton section of West Warwick, runs in a generally easterly direction emptying into Apponaug Cove. The Tuskatucket Brook and its associated pond areas, originates near the southeastern boundary of the Airport then runs southeasterly to Brush Neck Cove. The Parsonage, Warner, Buckeye and Lockwood Brooks drain collectively into Mill Cove on the southern side of Conimicut Point. There are also several small-localized streams that drain directly into the Bay. These include Baker's Creek (south of Arnold's Neck) and finally Foster Brook on Warwick Neck.

Many of these watercourses feed or drain various ponds, bogs or swamps in the city. Often they terminate in salt marsh areas at the shoreline. Each of these water resource types can be inventoried in following table, Major Ponds.

**Table 11**  
**City of Warwick Major Ponds**

Gorton's Pond
Little Gorton's Pond
Warwick Pond
Sand Pond
Posnegansett Pond (Arnold's Pond)
Spring Green Road
Three Ponds

Source: Department of City Plan, 1986



**Freshwater Wetlands** - Freshwater wetland types in the city include: riverine nontidal open water, lacustrine open water (lakes and ponds), palustrine open water, emergent wetland (marsh/wet meadow), scrub-shrub wetland (shrub swamp), forested wetland (coniferous and deciduous). The most common freshwater wetland types in the city are shrub swamps, palustrine (vegetated) open water and riverine nontidal open water (rivers, streams and brooks).

The following table lists the approximate acreage of freshwater wetlands in Warwick, as identified by the Rhode Island Geographic Information System (RIGIS). These include wetlands of at least 1/4 acre in size and wetlands with salinity less than 0.5 parts per thousand. Of the total 3,363.6+/- acres of wetland, approximately one third are freshwater wetlands. Freshwater wetlands of particular importance include wetlands along the Three Pond Brook system, Peat Bog and wetlands along Warwick Neck.

**Table 12**  
**Freshwater Wetlands in Warwick**

<b>Wetland Type</b>	<b>Acres</b>
Riverine Nontidal Open Water	181.17
Lacustrine Open Water	162.65
Palustrine Open Water	207.69
Emergent Wetland: Marsh/Wet Meadow	162.81
Scrub-shrub Wetland: Shrub Swamp	336.37
Forested Wetland: Coniferous	12.43
Forested Wetland: Deciduous	154.81
<b>Total Inland Wetland Area</b>	<b>1,217.94</b>

Source: Rhode Island Geographic Information System, 1990.

Wetlands in the city all have the same basic values, but some have, "... especially high ratings and should be regarded as being of critical importance to the community." <sup>23</sup> These wetland areas are the Buckeye Brook wetlands, the Spring Green Pond area to and including the salt marshes at Occupasstuxet Cove, the Baker's Creek tidal marsh, Hardig Brook swamps and marshes and the flood plain area at George Street in the Belmont Park area. These areas are all large in size, in areas of urban development providing valuable green space, surrounded by areas of high runoff potential and provide valuable wildlife habitats. Other important wetland areas in the city are listed by type in Table 13.

Because of Warwick's natural terrain (seaboard lowland area) and abundance of wetlands, stream and pond areas, many parts of the city exhibit flood plain characteristics. These areas, which are subject to 100 year storm incident flooding, are most frequently found along the low lying shore areas (Conimicut and Oakland Beach areas especially), along various river and stream beds and along some of the cove areas in the city.

**Table 13**  
**Major Wetland Areas**

<b>Coastal Wetlands</b>	<b>Freshwater Wetlands</b>
Mary's Creek	Cranberry Bog
Marsh Point	Peat Bog
Baker's Creek (brackish)	Foster Brook
Conimicut Point	Buckeye Brook Swamps
Capron Farm Creek	Spring Green Pond Wetland
Greenwich Cove	Hardig Brook Swamps
Buttonwoods Cove	George Street Floodplain
Mill Cove (terminus of Buckeye Brook, brackish)	
Brush Neck Cove	
Occupasstuxet Cove (terminus of Spring Green Pond Wetland)	
Gaspee Point	
Passeonkquis Cove	
Audubon Society Sanctuary at Mill Cove	

Source: Department of City Plan, 1986.

Building in floodplain areas can pose serious problems, both for the building itself and also for other development in and adjacent to the floodplain. The building, in particular, could be destroyed during a flood incident. Also the development could diminish the flood holding ability of the flood plain, causing a subsequent enlargement of its areas and endangering areas, buildings and property previously not within the flood prone area.

Floodplain development is regulated by the City of Warwick through its Zoning Ordinance, Section 3.8.1 which permits development in these areas only if the proposed development will be reasonably safe from flooding "and that the flood carrying capacity of any altered or relocated watercourse will be maintained." <sup>24</sup>

Rhode Island law to a degree protects all wetlands and waterbodies in Warwick. The Rhode Island Freshwater Wetlands Act of July 1971 was instituted to protect wetland areas from "... random unnecessary and/or undesirable ... disturbance or destruction" and to, "... preserve and regulate the use" of Rhode Island's wetlands.<sup>25</sup> In addition, land within 50-feet of any bog, marsh, swamp or pond is considered to be a wetland, as well as land within 100-feet of any river or perennial stream with less than 10-feet of channel width, or 200-feet of any river or perennial stream 10-feet of greater in width are also considered wetlands.

Alteration of wetland areas as defined above can only proceed on the approval of the Rhode Island Department of Environmental Management, Wetlands Division. This approval or denial will follow an administrative review or public hearing.

**Pawtuxet River** - The Pawtuxet River provides open space and recreational opportunities, and wildlife habitat, although its water quality has been degraded in recent years due to intensive development of the land surrounding it. The Lieutenant Governor's Task Force on Rivers, in a 1989-draft report, found that "the present condition of the Pawtuxet is most sad in light of the fact that the river had an outstanding ability to support a variety of recreational activities.

During the turn of the century, canoeing was such a tremendously popular activity. Numerous canoe clubs built boathouses along the banks of the Pawtuxet. In fact, a photo section that appeared in the Providence Board of Trade Journal during August of 1914 concluded that 'next to the Charles River in Boston, it is quite probable that there are more canoes on the Pawtuxet River than on any other American river of comparable size.' The canoe clubs, which were abandoned during the Great Depression, have never been rebuilt."

Attempts are currently underway by the Cities of Warwick and Cranston and the Town of West Warwick to improve the water quality by upgrading the regional wastewater treatment facility to the tertiary treatment level. In addition to this effort, the City should also encourage wider recreational use of the river, should coordinate with the other watershed communities in developing an appropriate approach for river management, and should review its stormwater management and development regulations to ensure that they provide suitable protection from pollution. The Pawtuxet River Authority coordinates the efforts of the five river communities, and Warwick should continue to work with the Authority in its efforts to improve the river's quality.

**Hunt River Aquifer** - While the City draws most of its drinking water from the Scituate Reservoir, it also shares a significant potable groundwater resource with neighboring communities. This groundwater resource is the Hunt River Aquifer system.

The Hunt River Aquifer System is located along the border of the City of Warwick and the Town of North Kingstown, and is also shared with the Town of East Greenwich. Its significant water yielding deposits consist of: moderate to highly transmissive (+80,000 gpd/ft) glacial outwash/ice contact deposits, which are situated in an area of about 3 1/2 miles long and 1/2 mile in width beneath and adjacent to the Hunt River. Saturated overburden thicknesses of 80 to 100 feet are present in the bedrock valleys that underlay the areas.

Similar materials of shallower depths, and thus lower transmissivity, surround these deposits. To the west, these materials abut glacial till. Till deposits have a very low relative water yielding characteristics. To the south, the (transmissive) deposits extend a distance of over 5,000 feet, eventually merging with the Annaquatucket and Pettasquamscutt Aquifers.

The groundwater resources present within the aquifer and surface flow within the Hunt River are naturally derived from precipitation within the Potowomut watershed. A number of brooks carry precipitation runoff and groundwater discharge, from over twenty square miles of upland located to the west within East Greenwich, to the Hunt River. A much smaller area of about two square miles to the east in North Kingstown and a small section of Warwick to the northeast also contribute precipitation runoff. Water is introduced to the aquifer both through direct infiltration of precipitation and through flow of groundwater from the till covering uplands and abutting shallow outwash deposits.

The Kent County Water Authority presently maintains wells, which draw from the aquifer. The viability of the aquifer as a drinking source is threatened by continuing development in the watershed. Land development poses a serious threat to this resource due to the multiplication of on-site septic systems, use of herbicides, insecticides and chemical fertilizers in residential landscaping, and the presence of underground storage tanks (UST's).

In response to these threats, a Wellhead Delineation Study Committee was formed with representatives from the affected communities and water service providers to study the aquifer and the impact of developing land use patterns on this resource. The committee funded a Wellhead Delineation Study and Protection Plan prepared by GeoEnvironmental Inc. (GZA). Elements of the effort were funded through a grant from the United States Environmental Protection Agency (EPA) administered by the City of Warwick. The objective of this study was

to provide East Greenwich, North Kingstown, and Warwick, and the water companies serving these communities, with the tools and information needed to protect the water supply while balancing the needs of all concerned. Output of the study is as follows:

- Identified wellhead protection areas at seven existing and one proposed well site.
- Provided legally defensible information and suggested regulatory language to the three municipalities for the implementation of land use regulations.
- Provided prioritized guidance for future acquisition of land to better protect groundwater quality.
- Assisted in identifying existing sites that represent potential sources of groundwater contamination.
- Helped establish and document how groundwater withdrawal practices at one location will influence flow in the river and availability of groundwater at other locations.
- Formed the basis for implementing public education and other non-regulatory programs.

As continuing population growth statewide puts ever increasing demands on established surface water sources (such as the Scituate Reservoir) the need to preserve groundwater resources is critical to the future development of Rhode Island communities. The loss of these resources due to contamination would severely limit these communities ability to provide these residents with safe and adequate drinking water supplies.

## Coastal Resources

**Table 14**  
**Coastal Wetlands in Warwick**

<b>Wetland Type</b>	<b>Acres</b>
Riverine Tidal Open Water	1,319.06
Estuarine Open Water	394.59
Marine/Estuarine Rocky Shore	6.20
Marine/Estuarine Unconsolidated Shore	147.97
Estuarine Emergent Wetland	277.20
Estuarine Scrub-shrub wetland	0.65
<b>Total Coastal Wetland Area</b>	<b>2,145.67</b>

Source: Rhode Island Geographic Information System, 1990.

Of the total 3,363.6+/- acres of wetland, approximately two-thirds are coastal wetlands. Coastal wetlands of particular importance include: Mary's Creek, Capron Farm Creek, Mill Cove, Greenwich Cove, Marsh Point, Buttonwoods Cove, Baker's Creek, Brush Neck Cove, Conimicut Point, Gaspee Point, and Passeonkquis Cove.

These wetlands are important for a variety of reasons. They provide food and shelter for a variety of juvenile fish, shellfish habitats, shorebird and waterfowl habitat, as well as erosion and flood control.

**Coastal Features** - The City has approximately 39 miles of coastline, which varies in character. Major features include: nine major cove areas, barrier beaches, and sandy and rocky beaches, beach bluffs and salt marsh areas. Sandy beaches and marsh areas are the most common shoreline types in the city. Marshland is generally more common along various coves of the City, with sandy and rocky beaches more typical of the exposed shorelines.

The nine major coves in the city are: Pawtuxet Cove, Passeonkquis Cove, Occupasstuxet Cove, Mill Cove, Warwick Cove, Brush Neck Cove, Apponaug Cove, Greenwich Cove and the Potowomut River. The use characteristics of the cove areas vary. The Pawtuxet, Warwick, Apponaug and portions of Greenwich Coves are used for high intensity boating and commercial harbor uses, while Passeonkquis, Occupasstuxet, Mill and Brush Neck Coves, Mary's Creek, Thatch Cove, and the Potowomut River are relatively undeveloped.

Barrier beaches are also an important feature of Warwick's coastline. Barrier beaches are "narrow unconsolidated strips of land, usually extending parallel to the coast and separated from the mainland by a coastal pond, tidal waterbody or coastal wetland."<sup>26</sup> These beaches serve as buffers against storms and offer a unique and valuable coastal environment.

Undeveloped barrier beaches in Warwick include: Baker's Creek, Buttonwoods Cove, Gaspee Point and Conimicut Point. These areas are especially sensitive to development. Building on barrier beaches can cause them to lose their natural function as storm barriers and as a public recreational resource. These beaches, in addition to other coastal features, are depicted in the following figure.

In addition, sandy and rocky beach areas are found along the unprotected shoreline areas in the city. These areas in the city are valued for their scenic, recreation, storm control and aesthetic character. For these reasons, policy should be geared to preserving these areas for use by

residents, especially for recreational uses.

Bluff areas are those shorelines that are significantly elevated above the water. These areas are fragile because of their slope characteristics. They are valuable for their scenic vistas, for flood protection, as a source of sediment for beach areas, and as a wildlife habitat. The slope of these areas is often greater than 15%. Beach bluffs can be found at various points along Warwick's shoreline including: Passeonkquis Cove, Gaspee Plateau, the south side of Gaspee Point, Rocky Point, parts of Warwick Neck and the north side of Potowomut Neck.

Under Rhode Island's Coastal Resources Management Council (CRMC) all coastal areas are rated for their use suitability under six use categories. These categories are described below:

**Table 15**  
**City of Warwick CRMC Use Categories**

Type 1	Conservation Areas
Type 2	Low Intensity Use
Type 3	High Intensity Boating
Type 4	Multi-purpose Waters
Type 5	Commercial and Recreational Harbors
Type 6	Industrial Waterfronts and Commercial Navigational Channels

Source: State of Rhode Island, Coastal Resources Management Council, 1983.

Coastal Resources Management Council policy is most restrictive toward development proposals in Type 1 waters and least restrictive in Type 6 waters. Type 1 areas in Warwick include: Gaspee Point south to Occupasstuxet Cove, Conimicut Point, Mill Cove, Oakland Beach and Brush Neck Cove, Mary's Creek, portions of Greenwich Cove, Sandy Point to the Potowomut River and the Potowomut River itself.

Type 2 waters are predominant along the exposed shorelines of the city. Pawtuxet, as well as most of Warwick and Apponaug Coves are all rated as Type 3 waters. Greenwich Bay and the West Passage of Narragansett Bay are Type 4 waters. Only one portion of Warwick's shoreline is classified as Type 5 water. This is a small section on the north side of Greenwich Cove lying both in Warwick and East Greenwich. The following figure, CRMC Ratings, Warwick Coastline, shows Warwick's coastline as it is classified by the Rhode Island Coastal Management Council.

Although the city has a large expanse of coastline, much of it is privately held, placing a limit on public access to the shore. Of the 39 miles of shoreline in Warwick, the city owns the largest single share, about 7.55 miles.<sup>27</sup> The State and Federal government own or control about 3.59 miles of the City's coastline. State recreational facilities at Salter Grove (Gaspee area) and Goddard Park in Potowomut provide access to the bay for Warwick, as well as State, residents. City owned bay access areas consist of major park areas, rights-of-way, tax lots and city owned lots.

**Coves and Bays** - Warwick's saltwater coves and bays provide ample habitat for finfish and shellfish, the most significant of which is the winter flounder.<sup>28</sup> Although the resources are available for commercial finfishery, Warwick's waters have been off limits for more than 20 years.<sup>29</sup> Commercial fishing is limited to restricted seasonal trawl fishery in the "Upper Bay" (Narragansett Bay between Warwick Neck and Conimicut Point) and seasonal baitfishery for menhaden.

The "Upper Bay" and Greenwich Bay are two of the State's most important shellfishing areas, producing most of the quahogs harvested from Narragansett Bay. These areas are regulated by the Rhode Island Department of Environmental Management which designates them as polluted, conditional or seasonal closure areas, or as approved shellfishing areas.

In December 1992, the Rhode Island Department of Environmental Management (RIDEM) temporarily closed Greenwich Bay due to high levels of fecal coliform. Realizing the implications of this condition to the environment and to the use and enjoyment of this coastal resource, the City drafted a "Greenwich Bay Reclamation Plan" (Department of Planning, August, 1993) which has as its focus the following:

- Assessment of physical conditions existing in and around Greenwich Bay;
- Impacts of these conditions on Bay water quality;
- Areas of concern which contribute most to pollutant loading of neighboring water bodies;
- Recommendations to remediate existing problems.

The study discusses twenty-three subareas in terms of physical characteristics, population and housing density, and marine activity. Conclusions are provided and areas of concern (hot spots) identified. These include portions of Arnold's Neck, Chepiwanoxet, Nausauket, Buttonwoods, Oakland Beach and Warwick Neck. The study also included a discussion of the roles and responsibilities of the institutional stakeholders in the Greenwich Bay water quality cleanup



effort. A series of recommendations address wastewater management, database management, research and development, communications, coastal management, land use management and plan enforcement.

Coastal areas, including coastal ponds and wetlands, are protected by the activities of the Coastal Resources Management Council (CRMC). The CRMC manages development of alteration within 200-feet of shoreline features. The council may grant a permit for the proposed activity after an administrative review, public notification and in some cases a public hearing.

## Water Quality

**Table 16**  
**City of Warwick Water Quality Classifications**

<b>Freshwater classifications are as follows:</b>
Class A - Suitable for water supply and all other water uses; character uniformly excellent.
Class B - Suitable for bathing, other recreational purposes, agricultural uses, industrial processes and cooling, excellent fish and wildlife habitat; good aesthetic value, acceptable for public water supply with appropriate treatment.
Class C - Suitable for fish and wildlife habitat, recreational boating, and industrial processes and cooling; good aesthetic value.
Class D - Suitable for navigation, power, certain industrial processes and cooling, and migration of fish, good aesthetic value.
Class E - Nuisance; unsuitable for most uses.

<b>Salt water classifications are as follows:</b>
Class SA - Suitable for all seawater uses including shellfish harvesting for direct human consumption (approved shell fishing areas, bathing other areas), bathing and other water contact sports.
Class SB - Suitable for bathing, other recreational purposes, industrial cooling and shellfish harvesting for human consumption after depuration, (restricted shellfish areas); excellent fish and wildlife habitat; good aesthetic value.

The majority of Warwick's fresh waters are classified as B or C. The lower Pawtuxet River is the most polluted water body in the city, classified E near its terminus at Pawtuxet Cove. Salt-water classifications are for the most part SA or SB. SC waters are found in Greenwich and Apponaug Coves as well as the Bay area north of Conimicut Point.

The value to the community of these various water-related resources is significant. They provide a source of water, a natural drainage system, flood control, wildlife habitats, recreational

opportunity, scenic beauty and more. Improper development along these areas can cause them to lose much of their natural abilities and value. Ironically, their fragile nature and amenity value often has the effect of making development in their vicinity desirable.

**Summary**

This chapter has attempted to inventory the principal land and water based environmental characteristics within the City of Warwick. This inventory identifies those areas with the greatest environmental sensitivity as well as those areas best able to accommodate development without degradation of the environment. Although these various characteristics are listed individually, it is important to note that these land and water based ecological systems are interrelated. This relationship is inextricable, as each system has an effect on the others. The importance of these environmental systems goes well beyond their location. Land use policy needs to consider and address these factors singularly and in concert with the total ecological system of the city.

## **CHAPTER 5**

### **MAJOR ISSUE ANALYSIS**

This chapter will include an identification and discussion of the major land use issues confronting the city. Most of this chapter will focus on the issues of strip development (Part One) and coastal development (Part Two). Other topics (Part Three) will deal with significant environmental features, current land use regulations, the airport, and public facilities (with an emphasis on sewerage and drainage). It should be noted that transportation and traffic related concerns are also very important issues affecting the city. However, due to their magnitude and complexity a separate "transportation element" study should be undertaken (although the strip development review will touch upon and overlap with numerous traffic related concerns).

#### **Strip Development**

"Strip development" can be broadly defined as a line, string, or row of commercial uses located along a major thoroughfare. This type of development tends to be constructed and expanded along major highways in a domino-like fashion. The term generally has a negative connotation especially when used by city planners.

The major problems stem from traffic congestion, high density (over-concentration of land uses), encroachment into residential neighborhoods, loss of open space, impervious lot coverage (leading to drainage problems), poor design including excessive curb cuts and obtrusive signage, and in general the ever-expanding nature of strip development. On the other hand, commercial interests often find strips desirable places to locate due to high visibility and high traffic counts. As a result, residential neighborhoods and city planners view this land use pattern as something to be stopped or strictly controlled while real estate developers see it as potentially profitable.

In a generic sense, the concentration of commercial uses along a major arterial is not necessarily poor planning. In many towns and cities, commercial cores or several smaller centers exist and should be encouraged. However, once development expands past the limits of the "downtown" area or "village centers", the symptoms of strip development begin.

Warwick, unfortunately, has basically never had a central business core or clearly delineated smaller commercial centers.

Due to the historical development pattern of the city, the Airport, and the City's physical geography, Warwick has suffered from fragmentation or what has commonly been referred to as "urban sprawl" (the expansion of spreading out of development in a haphazard manner). To

many residents and visitors alike, Warwick is a city where strip development has run rampant.

## Method

To closely examine all the major thoroughfares in the city, an intensive windshield (data recorded from an automobile) and walking survey method was employed. Other research sources included use of the 1985 Polk's Directory for the City of Warwick and City Plan Department aerial photographs. Once recording and mapping of all land uses was completed, accurate descriptions and land uses could be ascertained.

## Analysis

The following discussion presents an analysis of strip development and the major arterial highways in the city on a street-by-street basis. Streets are presented in general order of importance based on the length of the roadway in question and the current extent of strip development (although the significance of this ranking is minor and is used mainly for organizational purposes). Each section will offer a general and specific description of the particular area in question and discuss the more relevant land use issues.

### 1. Post Road

Post Road is the longest stretch of highway that runs through the city. From Pawtuxet Village at the Cranston line, it proceeds southerly through the entire city and is the only street which extends through Warwick proper into Potowomut. Post Road is also known as U.S. Route 1A north of Elmwood Avenue to Pawtuxet Village and U.S. Route 1 south of Elmwood Avenue. In order to describe and examine Post Road it is necessary to divide it into six sections (the discussion will proceed from a north to south direction).

**a. Post Road - Pawtuxet Village to Warwick Avenue:** This area is characterized by commercial development at each end both in Pawtuxet Village and at Warwick Avenue. The area in between is dominated by mostly medium and high density single family residences, the Warwick Industrial Park, the New Farm Supper Club site where very high density residential condominium development has been approved, a nursing home, and some new residential condominiums just outside the village.

The overriding land use factor along this section of Post Road is the comparative lack of strip development. Expansion of commercial uses beyond their current location has basically not occurred or has been very limited. The major consideration is whether or not non-residential uses should be allowed to expand into residential areas along Post Road. A related concern in

the issue of historic preservation, many of the buildings in and around Pawtuxet Village are considered significant. A change of use in any of them could negatively impact their historic value. Another issue would include the expansion of Warwick Industrial Park and potential impacts particularly to abutting residences. Finally, the very basic issue of appropriate density (generally, the number of dwelling units allowed per acre) needs to be addressed on a citywide basis. This issue is highlighted in this older area of the city by the high-density character and large number of small under-sized lots (less than 7,000 square feet).

**b. Post Road - Warwick Avenue to State Route 37:** This stretch of Post Road includes a heavy concentration of most high-density and some medium-density single family residences along the northeasterly portion. The opposite end, the southwesterly section, is dominated by intense commercial development. The area northeast of Cranberry Bog contains office and retail (Warwick Plaza) use while the area just southwest and across from the Bog holds mostly multi-family and single-family development. The area adjacent to Sand Pond contains a mixture of residential and commercial uses.

The major land use issue in this area is whether or not the strong residential character between Warwick Avenue and the Warwick Plaza and Aldrich School sites will succumb to strip development. Other concerns would be the narrow road width, high traffic counts, and number of access points particularly along the area between Elmwood Avenue and Route 37 (area of intense commercial development with vast amounts of pavement). Aside from too many curb cuts (or in many instances, continuous open access) and massive paved areas; many sites lack buffers, green space and vegetation, general design creativity, encroach into residential areas, and contain obtrusive signage. It should be noted that the problems along this area of Post Road are representative of many land use patterns along other major arterials. Finally, appropriate land use policy for sites adjacent to Cranberry Bog and Sand Pond is a concern.

**c. Post Road - State Route 37 to Greenwood Bridge:** This area is overwhelmingly non-residential in character including mostly retail, office, and heavy commercial uses. There is also a small pocket of single and multi-family residences south of Strawberry Field Road West. Traffic counts in this area, particularly at and around Airport Road, are the highest in the city.

The most important land use concerns in this area are encroachment into residential neighborhoods and design control or the lack of it. Most of the issues noted between Elmwood Avenue and Route 37 are prevalent here as well. Other important issues will be airport terminal expansion (in terms of increased traffic congestion and intensification, if possible, of strip

development) and expansion of the New England Technical School (in terms of further neighborhood infiltration, although it should be noted that there are many other examples of encroachment besides the school).

**d. Post Road - Greenwood Bridge to Veterans Memorial Boulevard:** This portion is characterized by fairly intensive commercial activity along the west side of the roadway heading south up to Potters Avenue. The east side of Post Road features highly developed commercial use up to where Myrtle Avenue intersects with Post Road. The remaining section, up to Veterans Memorial Boulevard on both sides, contains a mixture of uses such as office, residences, retail, and open space along Gorton's Pond.

While the general area is commercial, an obvious question will be: whether or not the section south of Potters Avenue and Myrtle Avenue becomes completely non-residential and links with the rest of the strip. Other areas of concern will be encroachment into residential areas (particularly the Greenwood neighborhood), development near Gorton's Pond, and design control in general.

**e. Post Road - Apponaug (the circle and Veterans Memorial Boulevard):** Post Road in Apponaug contains a heavy concentration of almost all kinds of land use, including industrial. The area can be described as a village center but remains very automobile dominated, which makes it difficult for pedestrians to use or enjoy.

There is a multiplicity of relevant land use issues in Apponaug. These would include traffic and parking, pedestrian access, signage, incompatible land uses, historic significance, and in general a new village concept (discussed in detail in the Apponaug Village Study, 1982 by the Robinson Green Beretta Corporation.

**f. Post Road - Centerville Road to Division Street including Potowomut:** As one moves south on Post Road past Apponaug four corners, there is a gradual change in the land use pattern. Once past Arnold's Neck Drive, this change becomes more obvious. Gone are the uninterrupted stretches of strip development, continuous pavement, and obtrusive signage. There is a decided shift to residential use. In fact, except for commercial development clustered at major intersections (Apponaug Four Corners, Cowesett Road, and Division Street), residential use dominates.

It can also be generally stated that most of the non-residential land uses are located along the east

side of Post Road. In addition, the west side of Post Road between Cowesett Road and two lots south of Corey Avenue is entirely commercial free. It is clear that, at present, there is no continuous linkage of commercial development along either side from Centerville Road (Apponaug Four Corners) to Division Street.

The most obvious issue between Apponaug Four Corners and Division Street is whether or not this basically non-commercial stretch will be converted to strip development. This area of Post Road contains more vacant parcels than other portions so there will be pressures to develop remaining tracts. The issue of appropriate use and density will be critical. Specific concerns could likely be institutional expansion of the Trudeau Center, development of land abutting the sensitive Mary's Creek and Thatch Cove, development of land adjacent to Cowesett Hills apartments, and historic preservation especially in the Arnold's Neck Drive vicinity.

Post Road in Potowomut runs from just north of Forge Road to, (moving south) the Hunts River at the East Greenwich line. This portion of Post Road is unusual in that there is a large area of land about in the mid-section that is within the boundaries of East Greenwich. The area in Warwick north of this East Greenwich parcel is predominantly residential. The area south of this point is all non-residential.

In Potowomut, the major issue would focus on the question of commercializing that portion south of Forge Road, which is mostly residential. Another issue would deal with the type and intensity of any future development affecting the Hunt's River.

## **2. Warwick Avenue**

Warwick Avenue is for the most part, an intensely developed arterial characterized by long rows of strip development. It is also known as State Route 117 up to Airport Road. South of Airport Road moving southerly to West Shore Road, it is known as State Route 117A. Warwick Avenue possesses relatively high traffic counts particularly around Airport Road where the counts are almost as high as any other section in the city. For the purposes of this discussion, Warwick Avenue will be divided into three sections:

**a. Warwick Avenue - Cranston line to Airport Road:** This area is characterized by a highly concentrated and generally continuous link of all types of commercial uses including retail, office, and heavy commercial development. The commercial uses are again, like any other major roadways, dominated by large areas of paving, obtrusive signage, and a basic lack of good design principles. There is, however, one stretch of properties around and across from Posnegansett Lake that is decidedly residential.

The residences along the east side generally between Independence Drive and Harrison Avenue are notably attractive and well maintained. There are three environmentally fragile water systems in this area, the Pawtuxet River, Posnegansett Lake, and Spring Green Pond. There is limited developable vacant land.

There are a number of prominent issues to be examined in this area. One concern involves the deteriorating condition of the strip between the Cranston line and Post Road. Specific areas of attention will be dis-investment (relocation of existing commercial uses), design control, and any future development impacts to the Pawtuxet River. It should be pointed out that a new retail complex is being constructed adjacent to the Zayre property. Hopefully, this might help to arrest some of the dis-investment and general blight that has occurred.

Other issues in this area, south of Post Road, will be the potential change from residential to commercial use for those properties (on both sides of Post Road) in the Posnegansett Lake vicinity. Development of redevelopment abutting the lake would be a matter of concern as well. In addition, any future development proposal near Spring Green Pond (especially the sensitive vacant tract across from the pond on the east side) will be carefully watched. Finally, design control as it affects new or redeveloped parcels will continue to be a serious matter.

**b. Warwick Avenue - Airport Road to Sandy Lane:** This is an area comprised of dense commercial development at the northern end near Airport Road and smaller, less concentrated commercial activity near Sandy Lane. The central portion is a rather hazardous, narrow roadway containing a variety of land uses at fairly high densities. This stretch is comprised of single and multi-family residences, retail, office and institutional uses. However, the lots between Church Avenue and Old Warwick Avenue hold substantially residential development. Vacant sites are limited.

Except for the established commercial pattern at either end, the remaining interior land uses are not linked in strip development fashion. The issue then is whether or not the area roughly between Lake Shore Drive and Old Warwick Avenue will eventually become all or predominantly non-residential. Furthermore, the development of vacant land abutting Buckeye Brook on the west side could have potential negative impact on the brook.

**c. Warwick Avenue - Sandy Lane to West Shore Road:** Between Sandy Lane and where Oakland Beach Avenue joins into Warwick Avenue, is an expanse of large scale retail uses (Warwick Plaza and the Super Stop and Shop). Once past this point, heading south, a mixture of



single and multi-family, school, industrial and commercial uses are encountered. From here the terrain changes to a rural farmland character up to West Shore Road (except for the commercial activity on the east side of the intersection with West Shore Road).

The most significant land use concern along this end of Warwick Avenue will be the question of farmland preservation. Farmland in Warwick is a dwindling resource. Will these agricultural lands end up as another shopping plaza, expanded industrial lots, an office park, or condominiums? A related issue here will be the potential impacts of development on the Warner and Parsonage Brooks.

### **3. West Shore Road**

West Shore Road, also known as State Route 117, provides a great deal of east/west access for many in the city. It is a long stretch of highway that meanders through the city in the form of a slight semi-circle. It runs from the north at Warwick Avenue in first a southeasterly direction and then a southwesterly direction to Post Road in Apponaug. For the most part, it is a highly developed arterial with very identifiable and separate sections of residential and commercial usage. One exception would be the Conimicut Village zone, which offers a mixture of various land uses. A description and analysis of West Shore Road is presented below in four separate divisions.

**a. West Shore Road - Warwick Avenue to Church Avenue:** Except for the commercial use around the intersection of West Shore Road and Warwick Avenue, residential land use dominates the streetscape up to Conimicut Village at Cambridge Street on the east side.

The west side, likewise is basically residential up to the two lots past Lachance Avenue near the beginning of the village. The village, as stated, contains a high density clustering of many different uses. Toward the southern end of the village, residential uses begin to outnumber other uses up to Church Avenue. There are also a few vacant lots.

Once again, one of the major concerns in this area will be the possible connection or expansion of strip development into residential areas. In addition, the idea of a Conimicut Village concept including revitalization and historic preservation will continue to be a meaningful topic. Any new development nears the Lockwood Brook and across from Spring Green Pond will also be a matter of concern.

**b. West Shore Road - Church Avenue to Oakland Beach Avenue:** This piece of roadway offers, by and large, a scenic residential atmosphere. Some of these residences are at low

densities, especially south of Sandy Lane. The area has one of the more picturesque and valuable wildlife, brooks (Buckeye), and marshland habitats in the city (located between Bend Street and Sandy Lane on east and west sides, some of the lots are city owned). The Parsonage Brook runs parallel to West Shore Road in this section as well. There are small pockets of commercial activity at the intersections of Warwick Avenue and Oakland Beach Avenue. There are some vacant lands particularly between Warwick Avenue and Oakland Beach Avenue.

The overall concern along this part of West Shore Road would be expansion of commercial activity and the resulting loss of residential and sensitive, open space lands. Traffic is often heavy and somewhat continuous in flow along most of West Shore Road. Expanded strip development would likely exacerbate the situation in this vicinity. Any future development in or around the Buckeye and Parsonage Brooks will also be an issue.

**c. West Shore Road - Oakland Beach Avenue to Wilde's Corner at intersection with Sandy Lane:** This part is mainly characterized by intense strip development consuming almost the entire length of roadway. In contrast to this pattern, is an area of concentrated single-family residences between Taplow Street and Hawksley Avenue on the south side. In general, the strip contains many large parking lots which at certain points are uninterrupted by curbing (allowing a motorist to drive parallel to West Shore Road from one parking lot to the next). In addition, the parking areas lack any separation of public and private space or a vegetated green strip between parking lot and the city right-of-way (this is a problem in many other areas as well).

Some of the topics to be discussed in this portion would include: the potential turnover of the above referenced residential blocks to commercial use and the general lack of any site design guidelines.

**d. West Shore Road - Wilde's Corner to Post Road in Apponaug:** This end of West Shore Road, like sub-area "b" discussed above is essentially residential. The notable exceptions, which contain commercial or industrial development, are Wilde's Corner, Buttonwoods and Nausauket Avenues, and Apponaug. Much of the residential development is characterized by attractive and well-maintained homes and some at low densities.

There are also a number of home-operated businesses along this heavily traveled way. There are very few vacant sites. The Tuscatucket Brook is also in this section.

The issue here, as has been the case repeatedly, is whether or not the commercial activity at these

major intersections will encroach into established residential neighborhoods. A related issue involves the relatively high number of customary home occupations and the ramifications of this type of activity. Protection of the Tuscatusset Brook will also be a concern.

#### **4. Bald Hill Road and Quaker Lane**

Once considered a rural highway providing access to the south county communities from Providence, Route 2 has evolved into Rhode Island's "main street". The northern part of corridor, from the Cranston line to the Lechmere site contains two regional shopping malls, shopping plazas and other smaller retail establishments. The second half, from Lechmere south to Division Street has been transformed by the establishment of three major commercial developments.

These developments are characterized by what have become known as "super stores", large-scale retail operations that specialize in high volume discount sales.

**a. Bald Hill Road - Cranston line to and including the Lechmere site:** As described above, this part of Bald Hill Road embraces the most concentrated section of large scale shopping centers in the city and surely one of the most impressive in both the New England region and the State. In addition, there are numerous mid-size and some smaller sized commercial developments. Possessing a few, scattered residences and virtually no vacant lots, the area is subject to increasing traffic counts.

The overall intent of this Land Use Plan, as stated, is the adoption of sound land use policy. It could be argued that sound land use policy is needed here more than any other area in the city (this would include the rest of Bald Hill Road and Quaker Lane up to Division Street as well). Specific areas of focus will likely center around continued expansion and re-use of existing sites for more high level commercial development. The question of appropriate use, density, and strict site design control will need to be addressed.

**b. Bald Hill Road - South of Lechmere site including Quaker Lane to Division Street:** The remainder of Bald Hill Road runs from south of Lechmere (on both east and west sides) to the intersection with Quaker Lane just south of the Kent County Courthouse site. Vacant land on this end of Bald Hill Road is rapidly being consumed by large-scale commercial development. That this development is a significant traffic generator is evident from the increasing traffic congestion centered around the intersection of Route 2 and Pace Boulevard as well as at the entrance to Lechmere to the north.

Development policy for this section of Bald Hill Road and the area south of this point along Quaker Lane will be critical. The northern and north central portion of the entire area has already developed as an intense, large-scale commercial corridor.

The issues here will deal with expansion and continuation of the commercial corridor, opportunity for mixed use or planned unit development, including multiple uses at one site, and overcoming the many physical constraints associated with the area such as slope, high water table, stony soils and loss of open space.

Quaker Lane runs from the north at Centerville Road south to Division Street. The centerline of the roadway serves as a boundary between Warwick and West Warwick. Property in Warwick is situated entirely on the east side. Development consists largely of office and heavy commercial activity. Vacant lands exist primarily in the north central section. The issues involved here would parallel those identified above.

## **5. Jefferson Boulevard**

Jefferson Boulevard and vicinity is easily recognized as the City's most dominant and visible industrial corridor. Providing municipal sewerage, good access to Interstate 95, and vacant parcels; the area has experienced considerable development and change. Aside from the many industrial endeavors, the area contains a growing number of office, and to a lesser extent, wholesale developments. While the area is clearly non-residential in character, there are still several small pockets of residential use. These small enclaves of residences include; single family homes between Illinois and State Avenues (both west and especially east side), several single and two family dwellings on the west side just north of Kilvert Street, and a row of historic duplex style mill houses south of Leviton up to Airport Access Road (both east and especially west side). In addition, the Pawtuxet River at the far north and the Three Ponds in the mid-southern section are located in this area.

The major concern for Jefferson Boulevard will be the encouragement and promotion of the entire area as an industrial corridor in contrast to the protection of the remaining, although shrinking residential uses. Another related issue will be whether or not there is a need to limit office, wholesale, or other non-industrial uses in an industrial area (in light of the decline in manufacturing employment). Other issues will revolve around historic preservation and site design guidelines (although it should be noted that some of the industrial and office uses in this vicinity have paid attention to landscaping details and general good site design principles).

## **6. Centerville Road**

Known as State Route 117, this arterial runs from Apponaug Four Corners in a due westerly direction to the West Warwick line. Traffic is steady and can be very heavy at the Four Corners, Bald Hill Road and Quaker Lane intersections, and the Route 95 interchange. Except for concentrations of commercial activity near Apponaug Four Corners, Interstate 95, Bald Hill Road and Quaker Lane, and to a lesser extent New London Avenue, land uses are essentially residential. In recent years, this arterial has been subject to office expansion, in particular around the Interstate Route 95 interchange.

A mixture of non-residential uses, some at the site of former residences, has also been proliferating along the north and especially the south side of Centerville Road between Route 95 and Apponaug. There are a limited number of vacant sites.

The central issue to be decided here, as elsewhere, will be the question of expansion of non-residential uses and encroachment into residential neighborhoods. Other issues of importance will be questions of appropriate densities, site design, and reuse of the Apponaug Mill site that could offer planned unit development potential.

## **7. Greenwich Avenue and Lambert Lind Highway**

Lambert Lind Highway begins at the Cranston line and continues south about 300 feet past where the Pawtuxet River crosses under said highway. At this point, it changes to Greenwich Avenue and runs southerly into Apponaug. This arterial primarily contains highly developed retail and other commercial uses north of Main Avenue. There is also a clustering of multi-family buildings (for the elderly) in this section just south of the Pawtuxet River. The land south of Main Avenue encompasses primarily single family dwellings. Commercial activity is located at both ends of this stretch and several office uses (some of the customary home occupation varieties) are situated between these points. Traffic along this section of Greenwich Avenue is light compared to other major arterials.

Development issues north of Main Avenue will likely center around density, design control, and expansion of non-residential activity into residential neighborhoods. The overriding concern south of Main Avenue will be whether or not this stretch remains residential in character or connects with the commercial development adjoining it. A related question could deal with customary home occupations. Should they be allowed, prohibited, or controlled by strict standards? This problem is not limited to Greenwich Avenue but is nonetheless important. Proliferation of home occupations is often the forerunner of strip development. Finally, any

development or redevelopment proposed near Gorton's Pond, Little Gorton's Pond, or the Pawtuxet River will have to reconcile potential environmental impacts.

## **8. Main Avenue**

Main Avenue, also known as State Route 113, is another important east/west arterial for motorists. It proceeds somewhat northwest from its intersection with West Shore Road to its intersection with Greenwich Avenue. The section between West Shore Road and the Greenwood Bridge is almost completely non-commercial in nature. It contains, by and large, single family residences, the airport runway, and the airport clear zone. The remaining piece, situated between Greenwood Bridge and Greenwich Avenue, accommodates mostly single family residences. In addition to the commercial uses at the intersections of Post Road and Greenwich Avenue, the interior portion along the north side includes several office uses (some, customary home occupations). At issue here, similar to other parts of the city, is the question of strip development expansion versus the preservation of residential land use. Those lots between the Greenwood Bridge and Greenwich Avenue are most vulnerable to strip development.

Commercial expansion in this section would likely further impact the Greenwood neighborhood. An additional concern would be the control of customary home businesses.

## **9. Tollgate Road**

This street can be considered a secondary arterial road. It runs from its intersection with Centerville Road in a northwesterly direction to the West Warwick line. The land uses between Centerville Road and Bald Hill Road have undergone a transformation in recent years. Where there were once mostly residential structures, there are now an increasing number of medical office buildings. This section also includes Kent County Hospital, a fair amount of residential uses (despite the recent trend), farmlands and some vacant parcels (although some are constrained by wetlands). The property west of Bald Hill Road is primarily residential with some office and heavy commercial use.

The most important matter of concern in this vicinity will be whether or not Tollgate Road becomes a hospital or medical office corridor. Related questions will deal with commercial encroachment into residential areas and loss of farmlands.

## **10. Airport Road**

Although a comparatively short stretch of road (about one and one half miles), this arterial is heavily traveled and developed. Situated between Post Road and Warwick Avenue, it serves as

one of City's important east/west traffic corridors. The eastern edge contains a rather intense mixture of retail, office and residential use. The central portion is dominated by airport property and the western side near Post Road is entirely non-residential. The main issue for Airport Road is whether or not future development or redevelopment will exacerbate traffic conditions. Other areas of focus will be the question of connection of commercial uses along the eastern side and site design control for the area in general.

## **11. Division Street**

Division Street, also known as State Route 401, generally serves as a boundary between Warwick (north side) and East Greenwich (south side). It runs between Greenwich Cove at the east in the due westerly direction to Quaker Lane. This arterial is a moderately to somewhat heavily traveled way, providing direct access to Interstate Route 95 and State Routes 2 and 4. The small section to the east of Post Road is almost entirely non-residential, including marina, industrial and heavy commercial uses. The interior portion, between Post Road and State Route 4 is decidedly low density residential. Some of the dwellings east of Love Lane and west of Post Road are historically significant. The area between Route 4 and Route 2 (Quaker Lane) consists mostly of heavy commercial and retail uses. There are some, but limited, vacant parcels which could be constrained by the several brooks and wetlands in the vicinity.

Once again, the most important topic will be encroachment into residential areas. Although the residential section contains expensive homes and a low density, rural setting, its proximity to Interstate Route 95 and State Routes 2 and 4 should make it vulnerable to commercial development pressure. Historic and environmental preservation will be other concerns.

## **12. Sandy Lane**

Sandy Lane can be described as a secondary arterial providing the city with additional east/west access. It travels from the east at its intersection with West Shore Road near Draper Avenue, in a westerly direction to its intersection with West Shore Road at Wildes Corner (note that Sandy Lane intersects West Shore Road at two different locations). Except for commercial development around the Warwick Avenue and Wildes Corner intersections, Sandy Lane is commercial free. The area is characterized by single family residential development including some multi-family dwellings. There are several small-sized vacant lots.

The obvious issue here is whether or not a residential character will be maintained. Encroachment into residential areas and around the City's sports complex near Wildes Corner will also be an important subject.

### **13. Elmwood Avenue**

Approximately a mile in length, Elmwood Avenue runs from its intersection with Post Road in a northerly direction to the Cranston line. Known as U.S. Route 1, this arterial generally contains moderate traffic. The land use pattern along Elmwood Avenue is similar to that of Warwick Avenue north of Post Road, except that there is more residential use on Elmwood Avenue. At best, the area can be described as a mixture of multiple uses (many incompatible with one another) and basically lacking any site design considerations. Like that portion of Warwick Avenue north of Post Road, it is an older section of the city that would greatly benefit from a facelift and major renovations.

The major issue for Elmwood Avenue will be whether or not further strip development and deterioration can be halted. This will be extremely important for the still viable and solidly residential Norwood neighborhood abutting the avenue on either side. The type of uses allowed and site design controls will also be important.

### **14. West Avenue**

Known as State Route 113, East Avenue proceeds from its intersection with Main Avenue in a westerly direction to the West Warwick line. The section between Main Avenue and Bald Hill Road is dominated by interstate highway property, large-scale retail, and school properties. The remaining part includes mostly high density one, two and multi-family residences as well as some businesses (some of which are located in residential structures). Some of the dwellings can be considered historically valuable and are similar to the mill homes identified along Jefferson Boulevard. The major concerns in this area will be; expansion of commercial development, historic preservation, and site design guidelines.

### **15. West Natick Road**

This street is clearly not as long as the others. However, because it borders the Pontiac neighborhood and provides access to the Warwick Mall, Lambert Lind Highway, and Route 2, it merits review.

It runs from its intersection with Old Greenwich Avenue in a westerly direction past Lambert Lind Highway to the West Warwick line. The area is almost completely commercial in character.

A major concern here is whether or not commercial expansion will continue to encroach on residential neighborhoods in Pontiac. The repeated themes of appropriate densities and design aspects will be important here as well.



## **16. Oakland Beach Avenue**

North of West Shore Road to its junction with Warwick Avenue: a short stretch of roadway, this arterial contains a considerable amount of vacant acreage, heavy commercial use, and few residences. The most pertinent topic will be whether or not the intense commercial activity along Warwick Avenue will gravitate south and encompass this end of Oakland Beach Avenue. Questions of appropriate use, density, and design control will be the center of attention.

### **Summary**

The discussion above focused on the major and more important secondary arterials in the city. There are, no doubt, other significant roads in Warwick, such as (but not limited to): New London Avenue, Providence Street, Buttonwoods Avenue, Long Street, Warwick Neck Avenue, Church Avenue, Norwood Avenue, Strawberry Field Road east and west, Cowesett Road, Love Lane, Diamond Hill Road, Oakland Beach Avenue, etc. These streets were omitted from the analysis of strip development for the simple reason that they are not major arterials nor are they commercially developed. They are nearly 100 percent residential in character. The issue then for these thoroughfares and those like them will be whether or not they maintain their residential environment and avoid encroachment of commercial development.

### **Coastal Land Use**

Warwick's position as a coastal community makes coastal land use issues and policy of great importance in preparing a Land Use Plan. Because of the nature of the coast, its importance, and sensitive character, these areas were subjected to a separate and more detailed analysis than those performed on other properties in the city (see Chapter 4 for a detailed discussion about coastal environmental characteristics).

This analysis consisted of a review of various data sources and literature (see bibliography) on Warwick's coastal areas became apparent. These are: 1) density and land use, 2) pollution and water quality, 3) shoreline access, 4) marine commerce, and 5) historic preservation. These all have an impact on the City's shoreline although their degree of effect varies within each of the thirteen sub-component areas (analysis zones). Each of these issues is discussed in a general sense below. Later sections will discuss these issues in the context of the thirteen-shoreline analysis areas.

### **Density and Land Use**

The issue of land use type and density, which can be defined as the number of residential units allowed per acre or general intensity of usage, is perhaps the most important and pressing

problem facing the City's coastal areas. Warwick possesses nearly 40 miles of coastline, with shorefront varying greatly in its environmental and use character. The beauty and natural amenity of these areas are attractive characteristics, which have caused coastal development to occur in the past. This attractiveness will cause this pressure to continue in the future.

The coastal study undertaken in 1983 by this department contains an analysis of coastal land use in Warwick for the year 1978. Although this material is not completely current, it does represent a reasonable approximation of Warwick's coastal land use picture. The table below depicts the results of this study.

**Table 17**  
**City of Warwick Coastal Land Use**

<b>Land Use <sup>(1)</sup></b>	<b>Acr es</b>	<b>% of Total</b>
Single Family	819.6	27.6
Two plus Family <sup>(2)</sup>	182.0	6.0
Commercial	188.8	6.0
Industrial	10.0	.3
Utility and Railroad	6.0	.2
Seasonal and Beach	169.0	5.7
Other Uses	244.1	8.2
Vacant	<u>1,346.2</u>	<u>45.5</u>
Total	2,965.7	100.0

Notes: 1 Coastal land area as defined by draft copy of Warwick City Coast Plan, March 1984.

2 Two plus Family includes apartments and condominiums.

Source: Warwick City Coast Plan, draft 1984, Department of City Plan

This table shows that vacant land comprises the majority of coastal land within the city. Single family residential is the next largest land user, consuming more than one-quarter of the City's coastline. Smaller portions of the coast are devoted to various other land use types.

Perhaps the most significant aspect of this table is the substantial amount of vacant land area along Warwick's shoreline. It is significant that land use policy can have its most direct effect on this vacant land. In addition, by determining the impact of regulatory policy (primarily zoning) on this land, the effectiveness or desirability of these regulations can be assessed.

Much of the existing pattern of land use on the City's shore is at densities that by today's standards would be considered excessive. This is especially true in some of older resort areas of the city, Conimicut Point, and Oakland Beach especially. In Oakland Beach the density of development eventually necessitated the extension of sewer lines into this area.

The prior table also indicates coastal areas being utilized for industrial, and heavy commercial purposes, this raises questions about the appropriateness of these uses at coastal locations. Currently Warwick's entire coastline is zoned for some type of use.

The following table indicates the relative proportions of these zoning classifications. Of note in the table below is that more than 90 percent of the City's coastline is zoned for residential purposes, and much of this is for high density.

**Table 18**  
**City of Warwick Coastal Properties**  
**Percent Composition by Zoning Classification**

<b>Zoning Classification</b>	<b>Percentage</b>
Residential A-40	32.2
Residential A-15	11.4
Residential A-10	22.1
Residential A-7	24.8
Limited Business	1.7
<b>Zoning Classification</b>	<b>Percentage</b>
Waterfront Business	2.2
General Business	1.3
Heavy Commercial	3.0
Automotive Business	0.2
Light Industrial	0.7
Heavy Industrial	
Total	100.0

Source: Warwick City Coast Plan, draft 1984, Department of City Plan

The densities permitted by the A-10 and A-7, zoning classification (where no sewers are available) are higher than those recommended by the 208 Water Quality Management Plan for Rhode Island published by the Rhode Island Statewide Planning Program in March of 1979. That plan recommended a minimum lot size of 15,000 square feet per dwelling unit for areas served by public water and on-site septic disposal systems.<sup>30</sup>

Some of the other zoning classifications would permit uses and/or densities of use that may not be appropriate for coastal settings (General Business, Automotive Business, Light Industrial and Heavy Commercial).

Also noteworthy is the fact that there is no open space/conservation or institutional designations; despite the presence of many large open space areas, estates, recreational sites, private non-profit entities as well as municipal and state holdings on the shore. Currently open space, recreational and city/state owned coastal areas are zoned for various residential densities.

The Rhode Island Coastal Resources Management Council has in place policy classifications for Warwick's coastal areas. These, as well as local zoning policies, effect coastal land use and are discussed in general terms in Chapter IV. Coastal Resource Management Council policy is also discussed below regarding its effect on land use issues within the thirteen coastal analysis zones.

### **Pollution/Water Quality**

Pollution and water quality issues are other important considerations in planning for future land use along the City's shoreline. The recent closure of Greenwich Bay to shellfishing by the Department of Environmental Management (RIDEM) is of major concern to the City. Suggested causes for the high fecal coliform levels in bay waters range from recreational boat holding tank discharges to non-point source runoff and the proliferation of residential development utilizing ISDS in coastal areas. If this closure becomes permanent, the impact on the local shellfishing industry will be significant. While the lack of public sewers is an issue, the low intensity character of development in most areas of the peninsula has probably helped to reduce water quality impacts to the surrounding waters. These waters support a variety of recreational (bathing, boating) and commercial (principally shellfishing) activities that are highly important to the City's functioning and quality of life.

The existing pattern of land use along the shore is varied in its use and density character. As noted, some of the residential densities currently in place are greater than those recommended by the State's "208" water quality plan (see previous section). Existing zoning (Residential A-7 and A-10) would allow vacant shoreline sites, in some instances, to be developed at these higher than recommended densities and in some cases for inappropriate uses. The water quality and density issues are inextricable, especially given the fact that the shoreline is not well serviced by public sewers.

Coastal pollution may come from a variety of different sources; generally they may be classified

as point or non-point sources. Point sources of pollution can be attributed to a specific source: a pipe, ditch, sewage overflow, boat mooring or similar identifiable conveyance. Non-point sources are relatively unquantifiable. Examples include stormwater runoff, landfill seepage, or erosion and sedimentation from construction activities. Stormwater runoff along Warwick's shore can be a particular problem because the city has no comprehensive system of storm sewers to handle this situation.

Because of Warwick's dependence on the coast for recreational, aesthetic and commercial pursuits, the maintenance and improvement of water quality is a necessary goal of land use planning. Potential negative effects from certain uses and densities of use need to be evaluated and addressed in the policy arena. Existing land use controls do not adequately address these issues.

Water pollution is also in many respects a regional problem and cooperative efforts among communities and at the state level are necessary. Such efforts go well beyond the scope of a general land use plan and should be addressed in a variety of forums. However, the local land use related aspects of water pollution deserve mention and attention in this plan.

**Shore Access** - Although Warwick possesses approximately 39 miles of coastline, the majority of this area is privately owned. The table below illustrates the ownership characteristics of the city coastline.

**Table 19**  
**City of Warwick Coastal Ownership Status**

<b>Land Use(1)</b>	<b>Miles</b>	<b>Percent</b>
State of Rhode Island	3.53	9.05
City of Warwick	7.55 (1)	19.35
Federal	.06	0.15
Private	27.86	71.43
<b>Total</b>	<b>39.00</b>	<b>100.00</b>

1 City ownership figures included park areas, tax lots, city streets and right of ways.

Source: City of Warwick Coastal Plan, draft 1984, Department of City Plan

The large amount of coastline in private lands limits public access to existing parks, rights of way and other publicly controlled access points. This obviously points to the need for city policy, which maximizes public accessibility to Narragansett Bay. This issue is of historic importance in the state, with public access to the shore being guaranteed by Article 17 of the Rhode Island Constitution. Due to different ownership patterns along the shore, the level of public accessibility varies within different areas. Generally, public access points exist in all

areas, but many times their status is obscure or their condition non-conducive to use. The identification, demarcation, maintenance, condition and level of use of these various access points are important considerations that need to be addressed relative to this issue. The 1994 Coastal Resource Management Council (CRMC) report lists 23 designated rights of way in Warwick, and 16 additional which are under study.

### **Marine Commerce**

The issue of marine commerce was also identified as a major concern addressed in the land use planning process. Principal marine commercial activities in Warwick are marinas associated with recreational boating and commercial shellfishing. Dredging for maintenance as well as for marina expansion is also an important consideration.

As in the case with other coastal issues, marine commerce questions and concerns are of greater relevance in some of the thirteen analysis areas than others. Historically marine commerce activities have tended to occupy some cove areas of the city and not others. In addition, this issue is interconnected with shoreline density, access and water quality concerns.

### **Historic Preservation**

Warwick's coastal areas were among the first places settled during the City's colonial beginnings. Therefore, it is not surprising that many aspects of the coastline have great historic significance. Examples of historic aspects of the city coastline include: Pawtuxet Village, Apponaug Village, Conimicut, portions of Potowomut Neck as well as the historic coastal resorts at Oakland Beach and Buttonwoods.

Given the historic character of the coastline it is an obviously important issue to be addressed in forming land use policy decisions. The subsequent portions of this examination of coastal land use issues will discuss this issue in the context of the thirteen coastal analysis zones.

## Coastal Land Use Issues by Analysis Zone

### Area I, Potowomut

Boundaries of this area run from Potowomut (Hunt) River on the south to the base of Greenwich Cove on the north side of Potowomut Neck.

**Land Use Description** - Potowomut Neck is characterized by low to very low-density residential land use, with one section of higher density residential use between Sandy and Sally Points. The area possesses an open space character due to the number of estate properties in the area, as well as recreational uses at Goddard State Park and Golf Course on the north and the Rocky Hill School on the south. There are some vacant lots in this area, these being generally large in size. Many parts of the coastal areas in Potowomut are environmentally sensitive with coastal wetlands (salt marshes principally) and areas of high aesthetic value. There are no coastal areas used for commercial and/or marine commercial uses in this area.

**Density and Land Use** - The existing coastal land use pattern in Potowomut is basically well suited to the environmental characteristics of the peninsula. This is especially the case for the estate type properties, the Rocky Hill School and Goddard Park. The only area where land use density may be greater than is desirable is the residential area between Sandy Point and Sally Point. Many homes in this vicinity are on very small lots (5,000 - 7,000 square feet). This density is high given the fact that Potowomut is not served with public sewers.

Although the existing density and type of land use on Potowomut is basically desirable, zoning regulations currently in place have the potential to alter the character of the area considerably. Although institutional, estate and recreational properties comprise a large portion of the peninsula, they are all zoned for residential usage. All of the residential zones can be found on Potowomut, but A-40 is most prevalent and A-7 the least. In fact, the estate type properties on the southern portion of the neck, the Rocky Hill School, as well as Goddard Memorial State Park, are all zoned for residential use. The appropriateness of this designation needs to be addressed in a policy sense. Also, many of the larger estate properties are under Rhode Island "Farm, Forest, and Open Space Act" to preserve them as open areas. Zoning these properties for one-acre residential usage needs to be evaluated. Current land use regulations do not directly address the issue of open space preservation, institutional use, or state or city owned recreational usage. This issue also needs to be addressed. The Sandy Point to Sally Point area is currently utilized for high-density residential use. Although not a great deal of this coastal area is vacant, it is zoned for A-10 usage. This designation could exacerbate the density issue and needs evaluation.

**Pollution/Water Quality** - In general the coastal waters off Potowomut Neck are of high quality. The only area where this is not the case is in the interior portions of Greenwich Cove where boating activity is intense. The recreational importance and scenic character of this area make maintenance or improvement of coastal water quality highly important. The fact that these waters are used for shellfishing and sport fishing also points out the importance of water quality here. The lack of public sewers is also an issue. The low intensity character of the peninsula has helped this area maintain high quality water characteristics and city policy needs to appropriately address these questions.

**Shore Access** - Potowomut is a peninsula surrounded on three sides by water. However, public access at the shoreline is not available at all points due to the ownership pattern of coastal properties. The state recreational facility at Goddard Memorial State Park and the small city park at Sandy Point provide accessibility to the Bay at their respective locations. In addition, several rights-of-way, beachways, and city streets provide direct neighborhood access to the coast. Key questions relating to the shoreline access issue in Potowomut are: public education and awareness, marking, maintenance and level of use of the various rights-of-way.

**Marine Commerce** - This issue is important to the coastal area of Potowomut in that the waters offshore are used for shellfishing purposes. No marinas or shoreline commercial uses currently exist.

**Historic Preservation** - The Potowomut area has a lengthy history, being first settled in early colonial times. The open space, estate character that is found in the area is a reflection of Potowomut's colonial pattern of settlement. In addition, there are several historic properties that are in close proximity to the shore. These properties are listed in detail in the "Statewide Historical Preservation Report, K-W-1, Warwick, Rhode Island." The preservation of the various historical aspects of Potowomut are important policy considerations within the land use planing process.

## **Area II, Southern Coastal**

This area is bounded by Division Street on the south, running northerly to, but not including, Masthead Drive.

**Land Use Description** - This coastal area displays a mixed-use character, with marine/commercial and industrial uses being predominant at either end of the stretch and high and medium density residential uses in the central portions. The railroad tracks are in close proximity to the shoreline making access difficult in many instances and limiting the usability of



many parcels. The most significant vacant site in this area is the Chepiwanoxet Peninsula. Other vacant areas are smaller and scattered about the area.

**Density and Land Use** - The existing land use pattern in this area is a cause for concern. The proliferation of apartment and condominium development east of Post Road, all of which is served by ISDS, is a major source of nutrient loading to the coastal waters. A further disturbing trend is the subdivision of larger residential properties on both sides of Post Road and the subsequent intensification of residential land use in an area not served by public sewers.

Currently land use regulations for this area in some instances promote uses and densities, which could be considered questionable. For example, at the southern end of the area in Norton's Shipyard which is zoned for Light Industrial purposes. As such, an industrial re-use of the property could take place. North of Norton's Shipyard, an area is zoned for Waterfront

Business, but the areas narrow configuration and relative inaccessibility makes this designation questionable.

Some of the vacant central portions of area are also zoned for high-density residential use (A-7). This designation could promote inappropriate land use densities. The Waterfront Business designation for the area just south of Folly Landing also needs evaluation as to appropriateness.

The Chepiwanoxet Peninsula, given the proposed development of condominium and marina use; is an especially good example of coastal development issues and policy questions relating to density and use, public access, appropriate infrastructure, water quality, environmental considerations and marine commercial concerns.

**Pollution/Water Quality** - In this area water quality is variable. Near the intensive marina areas at the southern end of this vicinity, water quality is rated as class SC. On the south side of the Chepiwanoxet Peninsula, the water quality designation is SB. The rest of the waters off this coastal section had, until recently, been classified as SA, but rising fecal coliform levels have prompted RIDEM to institute a temporary ban on shellfishing in this area. Should ongoing testing by RIDEM indicate that fecal coliform levels are not abating, then this closure could become permanent.

**Shore Access** - This area generally has limited shore access characteristics. This is due in large part to the position of the railroad parallel to the coast preventing through street usage in the area.

The program currently in place to eliminate dangerous railroad crossing will further isolate this vicinity.

The streets that do run through to the shore from Post Road are generally narrow and steep due to the area's general terrain characteristics. There are rights of way and city owned parcels that provide shore access, generally these are north of Chepiwanoxet and south of Folly Landing. Issues to be addressed here are identification, marking, maintenance, public education and awareness, and the level of use of these access points.

**Marine Commerce** - This area currently contains several marinas and marine associated businesses. Under current land use regulations these uses could be expanded or newly established. Such expansion may be appropriate, but impacts on residential areas, shellfishing concerns, water quality and other environmental issues, especially relating to dredging, need to be addressed in policy terms.

**Historic Preservation** - This issue does not seem to be of major importance overall in this area. However, there are some historic aspects to the area especially in the Division Street area as well as the resort summer colony in the central portion of the stretch. Preservation of the historic aspect of this area is a question to be addressed.

### **Area III, Apponaug Cove**

This area includes the Masthead Drive vicinity to, and including, the whole of Mary's Creek and Apponaug Cove to Darrow Drive off Oak Drive Avenue.

**Land Use Description** - The area is generally characterized by fairly intensive marine related commerce, including marinas, commercial and recreational, restaurant/lounges, and boat repair and sales facilities. There are also heavy commercial uses (lumber company) and industry (chemical company) in this vicinity. Residential uses of medium to high intensity can be found on Arnold's Neck. Lower density single family residential uses are established on the northern and eastern sides of Apponaug Cove between the Railroad Bridge and Darrow Drive. Environmentally sensitive vacant areas are found at Mary's Creek and Thatch Cove, just north of Masthead Drive. There are also several vacant lots in the stretch between the Railroad Bridge and Darrow Drive.

**Density and Land Use** - The mixture and intensity of land uses along this stretch of coastline raises several questions and concerns. The marine type uses are generally appropriate for the

cove area as well as the Masthead Marina area. Residential uses vary from high density in the Arnold's Neck area, to lower densities on the northern and eastern sides of the cove. The high-density residential area raises questions about appropriateness, especially since sewers are not present. The lower residential densities found in other portions of this coastal area do not raise significant policy issues. Other issues in this vicinity have been identified as being in appropriate for the location. These are the heavy commercial, lumberyard use (see the Apponaug Village study, Robinson Green Beretta Corporation), and the industrial concerns near the railroad line (see the City of Warwick Economic Development Task Force final report).

Existing land use regulations also raise usage and density issues. The environmentally sensitive area of Thatch Grove and Mary's Creek are zoned for Waterfront Business use.

The appropriateness of such a designation is questionable. Also, vacant shoreline parcels on Arnold's Neck are zoned for high intensity residential use. This raises the density issue, especially given the environmental fragility of this area.

Some of the vacant shoreline areas that are now zoned for A-7 high-density residential usage abut existing marinas. The appropriateness of such a designation needs evaluation. These vacant areas could potentially be utilized to permit marina expansion. Conversely, other vacant coastal areas in the cove are zoned for Waterfront Business usage and their suitability for such a designation merits evaluation.

The area between Post Road and the Railroad Bridge currently houses heavy commercial and industrial uses. Re-use potential of these sites or expansion of existing uses needs to be scrutinized given current zoning designations. Because of the mixture of uses present in this vicinity, the issue of re-use of existing sites should be evaluated. Re-use to more suitable type uses should be encouraged.

Although all of Warwick's shoreline areas are of great importance, the Apponaug Cove vicinity may be among the most important. The fact that Apponaug is the governmental center and an historic village area within the city is a crucial issue to be addressed in formulating coastal land use policy.

The Apponaug Village study conducted by the consulting firm of the Robinson Green Beretta Corporation notes the importance of the Apponaug Village and points to its potential as a "village center." The use of the cove waterfront as an integral part of the village of Apponaug is

a key element of their study. The existing land use pattern in Apponaug seems to be cut off the waterfront rather than including it in an overall concept. Policy direction that would link the Apponaug waterfront area to the village is a key issue to be evaluated.

**Pollution/Water Quality** - Water quality in this analysis area is SB in the outer portions of Apponaug Cove and SC at the inner cove. The existing land use character and potential for uses raise several water quality and pollution policy issues for consideration. Marine use and expansion of same poses a potential water quality question as well as dredge disposal concerns. Existing high-density residential uses in this area also raise these issues. The potential exists under current regulations for more high-density residential use in the area, which could affect water quality, especially since no public sewers are available.

**Shore Access** - As was the case with other areas discussed above, there are several rights of way and other access points to the shore in this stretch. Most of these are located on the south side of Apponaug Cove. Here, as above, the basic issues are public education and awareness, identification, maintenance and level of use.

**Marine Commerce** - This area has a long tradition of marine commercial use dating back to colonial Warwick. At this time there are several marine and marine-oriented businesses along the cove area. One of the principal issues associated with the continuance of these activities is maintenance dredging of the inner cove and dredging for expansion or establishing new marine uses. Related to this issue is the dredged material disposal question. Lack of disposal sites is identified as the number one constraint to marina growth in Warwick by the Rhode Island Marine Trade Association in their study, A Special Report on Warwick, The Boating Capital of Rhode Island, 1986.

Nonetheless, potential exists for continuation and expansion of marine commercial uses in this area, especially in promoting a village concept for the whole of Apponaug. Existing Coastal Resources Management policy identifies this area as Type 3 waters "High Intensity Boating" with the exception of the Thatch Cove and Mary's Creek area which is a Type I Conservation Area. These CRMC policy designations are intended to support and encourage marina/boating activity in the "Type 3" areas, while preserving and protecting the sensitive areas of Mary's Creek and Thatch Grove. These state policies must be considered into policy decisions that are made on a city level for this coastal stretch.

**Historic Preservation** - This stretch of coastline has a great deal of city history associated with

it. Commercial and marine associated concerns in Apponaug have a long established and traditional use of the waterfront and cove areas. The village of Apponaug is arranged around the cove and the use of the waterfront is a key to the traditional identity of the village. Many of the shoreline structures in Apponaug have historic significance. The preservation of these structures as well as the historic village atmosphere of Apponaug is an important issue and opportunity for land use planning in this vicinity.

#### **Area IV, Nausauket/Buttonwoods**

This area consists of the coastline from Darrow Drive east to, but not including Brush Neck Cove.

**Land Use Description** - This area is generally characterized by single family residential development at a mixture of densities. The high-density residential portion of this area is generally found at the eastern position of this zone, near the tip of Buttonwoods and in the central portions. Medium and low densities dominate the other residential areas. No commercial uses or marinas are present in this area.

This vicinity is of high scenic, aesthetic and environmental value. Especially important are Baker's Creek and the tip of Buttonwoods. Several larger vacant parcels along the shore contribute to the open space environment enjoyed by this stretch.

**Density and Land Use** - The existing land use pattern in this vicinity is basically comprised of residential and open space areas. The density of residential use is not generally an issue here except in the high-density areas noted above. The fact that shore areas along this stretch are not served by public sewers underscores this issue. The open space character of this shoreline is a distinct asset, and merits consideration in policy development.

Land use regulations currently in place along this coastal area have the potential to encourage inappropriate uses and/or densities. The area between Darrow Drive and Nausauket Road is zoned for Residential A-7 usage. Full development at this density is questionable. In recognition of the sensitive nature of the coast here, Coastal Resources Management Council policy classifies most of this area for low-density development (Type 2 area). Between Nausauket Road and Capron Farm Drive the zoning is mostly A-10. The Baker's Creek area is among the most valuable and sensitive natural areas in the city (in fact, much of this frontage is city owned). Designation of these city owned parcels as well as the Shriner's property for A-10 residential use requires evaluation from a policy standpoint. The Capron Farm Creek area to

Andrew Comstock Drive is zoned A-7. Designation of this highly valuable open space and wetland area for high-density usage is questionable.

The private Buttonwoods area east of Andrew Comstock Road is zoned for A-15 residential uses. However, vacant sites along this shoreline stretch do not generally meet the minimum requirement of that designation. Development on these narrow sensitive sites is an issue for policy evaluation. It should be noted that the A-15 zoning classification found here is viewed as being generally more appropriate for the shoreline than A-7 or A-10 designations.

**Pollution/Water Quality:** Existing water quality along this stretch is good (SB along Darrow Street to Cedar Tree Point) to excellent (SA) for the rest of this stretch. Except for the pockets of high-density residential uses, the existing land use pattern does not appear to generally raise pollution or water quality issues. However, full development of the area under existing regulations could have a negative effect on water quality of the Bay and the creeks in this vicinity. The lack of sewers in this area highlights these concerns. Extensive shellfishing and various wildlife communities are found in these waters. Water quality concerns are key for the continuance and viability of these activities and communities.

**Shore Access** - Accessibility in this stretch is somewhat limited due to private control of significant stretches of the shore (Shriner's property, Buttonwoods). Access is available west of Baker's Creek and at several other smaller areas.

The unevenness of access in this area graphically points out the associated issues of identification, maintenance, public education and awareness, and level of use of these shoreline access points.

**Marine Commerce** - Currently no marine related businesses are located in this particular area. Coastal Resources Management policy for this area is for High-Intensity Boating (Type 3 waters) between Darrow Drive and Cedar Tree Point and for Low Intensity use (Type 2 waters) between the point and the tip of Buttonwoods. Conceivably, marine usage could be an issue in the future, but presently such is not the case. Existing zoning would not permit the establishment of commercial marine uses.

**Historic Preservation** - Many portions of this vicinity have some degree of historic significance. This is especially true of the Buttonwoods and Nausauket areas. Cognizance of the importance of preserving the character of the area is an important issue for coastal policy determination.

**Area V, Buttonwoods/Brush Neck Cove Vicinity**

This area includes Brush Neck Cove from Buttonwoods tip to Canfield Avenue off West Shore Road.

**Land Use Description:** This area is basically characterized by residential land uses of varying densities, and City Park. The predominant residential land use in the Buttonwoods area is high density, single- family residential. High-density residential uses are also present near the other end of this expanse of shoreline (Canfield Avenue end). The remainder of this coastal area is characterized by lower densities of residential use, vacant areas, and the recreational area at City Park. The areas of open space and those areas designated for recreational uses are of high aesthetic and environmental value.

**Density and Land Use -** In general, the existing land use pattern along this stretch is well suited to the characteristics of the area with two exceptions. There are: 1) the high-density residential areas at Buttonwoods facing Brush Neck Cove, and 2) the area along the western base of Horse Neck (Canfield Avenue). The open space areas at City Park, the vacant areas and low-density residential areas do not raise density concerns.

Existing land use regulations pose potential questions in portions of this stretch. On the Buttonwoods side, the existing A-15 zoning is reasonably appropriate for the area. City Park is zoned for A-15 residential use and this should be evaluated. As was the case with Goddard Park, an open space type designation may be more suitable for this property. City land at the northwest portion of the cove is also zoned for A-7 usage. This should also be evaluated.

Full development of the residential A-7 and A-10 zones at the head of Brush Neck Cove on the north side of City Park could also lead to undesirable densities on sensitive parcels. No sewers are located in this area.

**Pollution/Water Quality -** Brush Neck Cove is one of the most unique natural assets in the city. Water quality in the cove is SA (highest quality). This area is also classified as a Type 1 conservation area by Rhode Island's Coastal Resources Management Program because it is an area of diverse wildlife. Preserving the quality water in this vicinity is an extremely important issue for coastal planning. The recreational use present at City Park and its importance to the city is an added concern for water quality in the cove. Of additional concern is the fact that the

high-density residential areas not served by sewers.

**Shore Access** - Public shore access in this vicinity is not equal at all points. The private Buttonwoods section does not have areas permitting public shoreline access. City Park, however, is a major access point. Rights of way are also present off West Shore Road. Access issues to be addressed include: public education and awareness, identification, maintenance and level of usage of these shoreline access points.

**Marine Commerce** - In this stretch, marine commerce is not of major concern. Currently, no commercial marinas are located in this area because Coastal Resources Management Council policy designating this area for conservation purposes thus prohibiting commercial uses in this area.

**Historic Preservation** - Parts of this coastline have historic significance. In developing coastal policy, it is important to preserve the historic character of these areas.

#### **Area VI, Oakland Beach**

This area consists of the coastline between Canfield Avenue to and including the city beach property.

**Land Use Description** - The coastline in this area is characterized by medium and high density single family residential land usage, and vacant sites in the northern portion of this stretch. The central portion of the stretch is comprised largely of vacant coastal and fringe marsh areas. A small marina and a few residences are in this portion of the stretch. The remainder of this coastline is comprised of city owned recreational land (Oakland Beach).

**Land Use and Density** - The existing land use pattern in this vicinity raises density issues in the northern portions and at the site of the small marina. The remaining portions of the area which are vacant or used for recreation are well suited to their waterfront setting.

Land use regulations now in place along this stretch raise both use and density concerns. All of this shorefront is zoned for A-7 residential use. Full development of this area at high density is a serious issue. The suitability of such development is questionable, though sewers are available in portions of the shore line area. This is especially true of the waterfront lots along Seaview Drive. These are narrow, marshy and seemingly offer very limited development opportunity. The A-7 designation for the city recreational lands at Oakland Beach is also an issue for policy



consideration.

**Pollution/Water Quality** - Water quality within this analysis area has significantly declined as is evidenced by the shellfishing closure of Brushneck Cove and Greenwich Bay. While sewerage is available to the majority of properties in Oakland Beach, the number of sewer tie-ins is substantially less than what is possible in this area. This fact, combined with the small lot sizes, aging and undersized ISDS, and the presence of marina and boat moorings, has contributed to the decline in water quality. Coastal policy on all Brush Neck Cove areas and areas around Oakland Beach needs to weigh existing and potential impacts to the area's coastal resources. Without excellent water quality, the value of these resources has and will suffer.

**Shore Access** - This area includes many shore access points. Issues here include identification, maintenance, and level of use and public education and awareness.

**Marine Commerce** - Although only one recreational marina is located in this area, requests for maintenance dredging would be a major concern. The extensive recreational use of the area as well as the excellent water quality in the area requires that any introduction or expansion of marine uses be carefully evaluated. Also, this entire area is classified by the CRMC as a Type 1 conservation area, such a designation would not permit the introduction of marine commercial uses in the area.

**Historic Preservation** - The Oakland Beach area, as one of the earliest summer resort colonies in the city, has historic character and value. As such, coastal land use policy should address the preservation of the traditional identity of this area.

### **Area VII, Warwick Cove**

This area of shoreline runs from north of the city beach at Oakland Beach around the Warwick Cove perimeter to Randall Avenue on Warwick Neck.

**Land Use Description** - The Warwick Cove area's most dominant land uses are the various marina and commercial marine uses situated along its shoreline. Thirteen marinas in the cove provide services and shelter for more than 1,500 boats. This cove has a larger marine identity than any other cove in the city.

The western side of the cove (Oakland Beach) contains marina uses and many single family residential uses at medium and high densities. Numerous undersized vacant lots along with

several larger parcels are present as well. At First and Second Points, intensive marine uses are situated along with vacant areas. Coastal wetlands of various sizes are found in this area at the head of Warwick Cove.

Beyond First Point much of the coastline is vacant with some low-density residential uses in this stretch along with vacant parcels of various sizes. Small private boat moorings and ships are also in this area. The last portion of this coastal analysis area, Tiffany Avenue to Randall Avenue, is characterized by vacant sites, scattered marinas, and several medium density residential uses.

**Density and Land Use** - Existing land use in this stretch raises some concerns relative to the use and density issues. The existing high-density residential and marine land uses need to be evaluated in determining appropriate coastal policy. This is an issue even though sewers are available on the Oakland Beach side and the fact that the area has traditionally been used for marina purposes. These factors would have a tendency to mitigate density concerns to a degree. The marina proximity to the coastal wetlands at the inlets of the cove (First and Second Points) is also an issue for policy consideration.

The land use regulations currently in place for this stretch are generally for Waterfront Business and high (A-7) to low density (A-15) residential uses (at the end of the stretch). The A-7 and Waterfront Business designations in place on the Oakland Beach side of the cove do not seem to be too problematic. Setbacks from the shore and use of buffers between business and residential uses are a concern. A-7 zoning at the coastal wetlands of the cove and on the northerly portions of Warwick Neck could promote undesirable densities of use and are a question for policy consideration. It should be noted that these coastal wetland areas are classified as Type 1-conservation areas by Rhode Island's Coastal Resources Management Program.

**Pollution/Water Quality** - The water quality rating for Warwick Cove is generally good, earning a SB classification. The maintenance of this water quality rating is an important issue for consideration. The existing, as well as potential development of Warwick Cove for marine and residential purpose needs to be evaluated in light of these water quality concerns. Additional concerns in this area include the coastal wetlands at the head of the cove, the existing and potential expansion of marina areas, as well as maintenance dredging and disposal questions.

**Shore Access** - Shoreline access for the general public is available in this area, especially the Oakland Beach side of the cove. Issues of concern here are the same as those identified for other

areas: public education and awareness, identification, maintenance and level of use of these various shore access points.

**Marine Commerce** - The most intensive area of marine commercial use in Warwick are located in the waters off of this particular shoreline area. These marinas host both commercial shellfishing and recreational boating uses. Maintenance of the marine activities and possible expansion of boating interests are primary issues of concern to coastal land use policy as previously noted. Rhode Island's Coastal Resources Management Council has designated most of this shoreline as fronting on Type 3 High Intensity Boating waters. This recognizes the traditional use of the cove as well as the potential for expansion. Other main issues relating to marine commerce are: dredging and dredge disposal for maintenance or expansion, preservation of coastal wetlands, minimizing land use conflicts, and water quality/pollution issues relating to shellfishing and recreational uses.

**Historic Sites** - Again as noted in the discussion of Area VI, the Oakland Beach summer colony is of historic importance as an early example of Warwick's resort tradition. On the Warwick Neck side, the open space estate character of some of the larger homes is an example of another kind of early summer settlement. Preservation of this character, and of properties of particular historic value is an issue needing attention in formulating coastal land use policy.

#### **Area VIII, Warwick Neck, western shore**

This coastal area begins at Randall Avenue and proceeds southerly to, and including, Warwick Light.

**Land Use Description** - This coastal area is characterized by a low-density residential use, large vacant tracts between Randall Avenue and Kirby Avenue, the Warwick Country Club, and Warwick Light. A small marina is situated at the northern end of this stretch off the end of Randall Avenue.

**Density and Land Use** - The existing land use pattern along this coastal area does not raise the issue of excessive density. The rural, open space, estate type of atmosphere present is well suited to this scenic and valuable coastal stretch.

Existing zoning on this coastal area is mostly for A-40 residential uses with one area of waterfront business at Randall Avenue. Generally, the densities possible under this zoning district would not be inappropriate for the characteristics of this area. However, an open space

designation for the golf course should be considered. Also, an institutional classification zoning for Warwick Light should be considered.

**Pollution/Water Quality** - Water quality for this shoreline section is excellent, earning a SA classification from the Rhode Island Department of Environmental Management. The existing density of shoreline land use does not pose a threat to this rating. Potential densities under the A-40 zoning classification probably are compatible to maintaining the water quality of this area. Low densities of development are desirable in this area especially given that sewers are unavailable and environmental constraints are present along this stretch. Consideration of appropriate shoreline buffers to protect water quality is also important along this portion of the coastline.

**Shore Access** - Public access to the shore in this area is somewhat limited. This is largely due to the ownership pattern of coastal properties as well as the relatively small number of streets in the area. Shore access issues for consideration include: public education and awareness, identification, maintenance as well as level of use. The fact that access points are limited in this area highlights the importance of this issue.

**Marine Commerce** - This is not a really large issue in this area. The existing marine uses are small and located at a small portion of the coastline only. Shellfishing off of this coastal section is important. Maintenance of the excellent offshore water quality is an important consideration for the continuance of shellfishing in this area. Coastal Resources Management Council policy for this area would not permit commercial marinas to be established.

**Historic Sites** - The open space and estate character of this area reflect the historic settlement pattern and character of Warwick Neck. Warwick Light is noteworthy as a historic site. Preservation of the character of this area, as well as specific historic sites, is an important consideration for coastal land use planning.

#### **Area IX, Warwick Neck eastern shore**

This area is comprised of the eastern shore of Warwick Neck from Warwick Light to, and including, Rocky Point.

**Land Use Description:** This area is basically comprised of low and very low density residential uses, institutional use (the seminary) and Heavy Commercial use at the Rocky Point Amusement Park.

**Density and Land Use** - The majority of the existing uses along this stretch are fairly well suited to the character of this coastal area. However, the heavy commercial use at Rocky Point raises questions relative to density as well as use conflict with adjacent residential area and the overall scenic value of this area.

Zoning for this area is residential A-40 except for the Rocky Point area, which is zoned for Heavy Commercial use. The A-40 designation is suitable for area IX although the Heavy Commercial designation at Rocky Point could permit a number of reuses and expansion of use on the site that may be undesirable.

**Pollution/Water Quality** - Water quality in this area is excellent (SA rating). The development of this area at low or very low density to maintain this rating is an important consideration. This is especially true given the constraints associated with this area and its significant environmental quality. The current heavy commercial use at Rocky Point and its potential for reuse or expansion merits evaluation against the water quality issue.

**Shore Access** - The ownership pattern and small number of city streets in this vicinity limits public access to the shore to an extent. Issues for consideration in this area regarding shore access are: public education and awareness, identification, maintenance, and level of use of these shore access points.

**Marine Commerce** - The Rocky Point Amusement Park is the only shoreline commercial use in this area. This coastal area is designated for Type 2 Low intensity use by the CRMC. Type 2 areas are intended for uses as low intensity residential and water-oriented recreational uses. Marine commercial uses are not permitted under this designation. Questions to be addressed in forming shoreline policy include appropriateness of continuance of the current Heavy Commercial use and expansion possibilities or reuse of this site.

**Historic Sites** - In general, this coastal stretch has historic value as a reflection of the coastal settlement pattern of the city. In addition, individual properties such as the seminary (the former Aldrich Estate) may be of specific historic interest. Preservation of the character of the area, as well as sites of specific value, is an important question for policy development consideration.

### **Area X, Conimicut, South**

This area begins at the northern boundary of the Rocky Point Park property continuing northerly

to the tip of Conimicut Point. This area includes the coastline fronting on Mill Cove.

**Land Use Description** - This area is characterized by residential development of varying densities, significant vacant areas and city recreational facilities. The southern portions of this coastal stretch are more heavily developed than are the central portions, the northerly area, Mill Cove vicinity, or the south side of Conimicut Point. Vacant areas are present all along the stretch, though they are most prevalent in the middle and northerly portions of this area. The city owns a significant amount of property within this zone, principally Bayside Beach and Conimicut Point itself.

**Density and Land Use** - The existing land use pattern along this shoreline raises density issues only in the areas where high density residential enclaves directly abut the coast. These areas are found between Rocky Point to Alden Avenue, parts of the southern shore of Mill Cove, and small area along the north coast of Mill Cove to Conimicut Point. The medium and low-density residential areas in this area do not raise density issues.

Existing land use regulations along this area are primarily for high density residential (A-7) and to a lesser extent medium density residential (A-10). The A-7 designated areas could promote densities that may be undesirable. The designation for city owned parcels at Bayside Beach and Conimicut Point also merits evaluation. The lack of public sewers to service this area underscores the density issue in the A-7 zoning district. The A-7 zoning designation for the environmentally sensitive shoreline areas of Mill Cove and Conimicut Point reiterates the issues of appropriate uses and densities and should be evaluated. Mill Cove and Conimicut Point are Coastal Resources Management program Type 1 conservation areas. The small estuary environment on the south side of Conimicut is also especially valuable.

The A-10 (medium density residential) designation for parts of this coastal area could lead to excessive densities. The use of appropriate buffers for development along this coast should also be investigated. Lastly there is a small area zoned for Waterfront Business between Samuel Gorton Avenue and Park Avenue. The suitability of this designation for this area should be determined.

**Pollution/Water Quality** - The water quality in this area is excellent (SA rating). The area is extensively used for recreational purposes and shellfishing, and contains environmental features of great value (Mill Cove, Conimicut Point/ estuaries, etc.). In addition, some of these coastal areas are erosion-prone including the areas between Pender and Bolster Avenues and the south-

facing portion of Conimicut Point. These factors need to be considered in the formation of coastal policy. In addition, the A-7 and A-10 zoning classifications without sewers could have a potentially negative effect on water quality in this area.

**Public Access** - This area provides some access points to the Bay including various of rights of way, city streets, and recreational areas. The public access issues in this area are the same ones identified above: public education and awareness, identification, maintenance and level of use.

**Marine Commerce** - Presently there are no marine commercial activities on this shoreline. The one area zoned for Waterfront Business use is currently vacant and as noted above is questionable as to its suitability for marine use. The issue is not of major concern for this particular area.

**Historic Preservation** - Current efforts to revitalize and preserve the historic area of Conimicut should be considered in developing coastal land use properties. In addition, the preservation of sites or properties of particular historic value should be addressed in the development of coastal policy.

### **Area XI, Conimicut North**

This area begins at the tip of Conimicut Point, then proceeds along the coast in a general northerly fashion to, and including, Cole Farm, at the beginning of Occupasstuxet Cove.

**Land Use Description** - This area is characterized by medium and high-density single family residential uses. There are also scattered small to medium sized vacant lots interspersed along this stretch. The higher density residential uses are more common at the southern portion of this stretch, while larger lots are more common in the middle and northerly parts of this area. The city recreational facility at Conimicut Point is situated at the beginning of this area. At the other end of this coastal stretch is the Cole Farm private residential development. This consists of a cluster of homes set back from the shore and a large open space area that fronts on the Bay and Occupasstuxet Cove.

**Density and Land Use** - The existing use and density pattern along this section of coastline does not, for the most part, raise significant use or density issues. The only area where density may be of concern is just north of Conimicut Point, some of the lots in this particular vicinity are small and the homes on them are situated in close proximity to the water. Conversely, the clustering of homes at Cole Farm, with its significant open space areas and substantial setback from the shore

is an example of coastal development that is sensitive and well suited to its location.

Land use regulations now in place along this stretch could raise issues of usage and density in the future. This area is currently zoned for high and medium density residential uses (A-7 and A-10 respectively). The A-7 designation for the city owned park north of the tip of Conimicut is questionable. Full development of the areas zoned for A-7 use could be problematic especially since no sewers are available and thus should be evaluated. The A-10 area should also be studied for its suitability. As with all of these shoreline areas, the need for suitable buffers from the shore for all types of development should be considered.

**Pollution/Water Quality** - Water quality in this area is generally good (SB) along most of the stretch and fair (SC) north of Cole Farm including the cove. The CRMC classifies Occupasstuxet Cove as a Type 1 conservation area. The remainder of this vicinity is classified for Type 2 Low Intensity use. The main issue here is the need to preserve and/or improve the coastal water quality. Increased shoreline development has the potential to exacerbate the water quality and pollution conditions already present.

**Shore Access** - There is some public access to the shore in this area except in the private section at Cole Farm. The general issues associated with public access here are the same as discussed above. These are public education and awareness, identification, maintenance and level of use of the various points of public access.

**Marine Commerce** - These concerns are not generally an issue in this area. Shellfishing is not permitted in SB areas, and the cove area is not well suited for marine commercial uses.

**Historic Preservation** - This area has a rich historic tradition. Current efforts to revitalize and preserve the Conimicut area should be considered when formulating coastal policy for this area.

### **Area XII, Gaspee Point, Occupasstuxet and Passeonkquis Cove**

This area begins at Occupasstuxet Cove and then proceeds to the northern side of Passeonkquis Cove. Also included is the Gaspee Point area.

**Land Use Description** - The Occupasstuxet Cove area is mostly comprised of salt marsh areas with some low to very low density residential and estate type uses present. An open space, conservation character is evident in this vicinity. The Gaspee Point vicinity is characterized by a former summer colony of fairly high-density residential uses situated on leased land. Vacant,



open space areas are situated on the northeastern portion of the site. The Passeonkquis Cove shoreline basically consists of marshland and various wet areas. There are several pockets of medium and low-density residential areas along this cove.

**Density and Land Use** - The land use pattern present along this coastline does not generally pose the issue of inappropriate use, since it is all residential or open space. Density concerns generally are not present since low and medium densities of use are predominant. There is however, one area at Gaspee Point that contains high-density development at close proximity to the Bay. No sewers serve this residential area.

Presently this area is zoned for residential use; mostly for A-10 use with a small portion of A-7 zoning on the north side of Passeonkquis Cove. Given the fact that this entire area is classified by the CRMC as a Type 1-conservation area, such a zoning designation may be inappropriate. Also, some areas fronting on Occupasstuxet Cove are under the provisions of the state sponsored "Farm Forest and Open Space Act" to protect them from development. Designation of these areas for A-10 uses needs evaluation. In addition, questionable density levels could result if the substantial amount of vacant parcels present were fully developed under existing regulations. This issue merits evaluation.

City owned coastline property on the north side of Passeonkquis Cove is zoned for A-7 residential use again as cited previously this designation may be inappropriate. All along this analysis area, the density issue is exacerbated by the lack of sewers along this sensitive shorefront.

**Pollution/Water Quality:** Water quality in the area is fair (SC). Maintenance or improvement of this rating is an important consideration for coastal policy development. Although water quality in this area is not the best, the coves within this area are highly valued for their wetlands, as wildlife habitats and green space characteristics. These values depend heavily on the maintenance of reasonably good water quality.

**Shore Access** - Due to ownership pattern and lot configuration of this area, access along the shoreline is somewhat limited. The issues here are the same as those identified above (public education and awareness, identification, maintenance and determination of level of use).

**Marine Commerce** - These concerns are not viewed as being significant in this area. Coastal Resources designation of this area as Type 1 waters will not permit the establishment of marinas

or commercial marine uses. Recreational boating is important in the area, but shellfishing is not permitted in these waters.

**Historic Preservation** - This area has many aspects of historic value. The northeast side of Gaspee Point is zoned for historic preservation and many of the individual properties in the area are valuable. This value needs to be reinforced in developing coastal policy.

**Area XIII, Pawtuxet, Gaspee Point Drive to Pawtuxet Village**

This area begins at Gaspee Point Drive and proceeds northerly to the Cranston line.

**Land Use Description** - This area is characterized by a mixture of residential densities, most of which would be classified as high and medium. There are also some low density residential parcels and multi-family residential uses. Vacant parcels are interspersed at various points along this stretch. Various marina uses are present in Pawtuxet Cove, as well as boatyards and private slips and moorings. The state recreational facility at Salter Grove is another important feature of this coastal vicinity.

**Density and Land Use** - The existing land use pattern along this coastal area is intensive in its character and has been long established. The issue of density is present in the areas of high-density usage, especially since sewers are in place only north of Canonchet Avenue. Land use issues should arise from the proximity of some of the marine commercial and recreational uses in the area to residences.

This area is primarily zoned for A-7 residential use, with two pockets of Waterfront Business zoning and an area of General Business zoning at the Cranston line. Expansion of Waterfront Business could be possible under CRMC policy guidelines (mostly as Type 3 waters; high intensity boating) and existing zoning (WB). Some vacant areas currently zoned for residential use could potentially be developed for marine or mixed-use purposes. Full development of the A-7 and business zoned properties would raise additional questions of density and use. In addition, the state recreational facility at Salter Grove and various city owned parcels are zoned for Residential and/or Waterfront Business uses. These designations require evaluation. The General Business designation at the Cranston line should also be evaluated for its appropriateness.

**Pollution/Water Quality** - Water quality in this area is fair, being classified SC by the State Department of Environmental Management. The maintenance or improvement of this

designation is an important consideration for coastal policy development. The water quality/pollution issue is also related to intensity of coastal development, availability of public sewers, urban runoff, type of use, and marine activities (marina, dredging, etc). Other considerations which are beyond the scope of a Land Use Plan (such as sewage treatment plant discharge, industrial discharge, etc.) also have a water quality effect and must be dealt with in the appropriate arena. Coastal policy needs to balance development considerations with these water quality issues.

**Public Access** - Public access in this area is generally available compared to other areas. The issues to be addressed here are the same as identified above (see earlier sections).

**Marine Commerce** - This area has a long history as a sheltered harbor for boating. Coastal resources Management Council policy recognizes this in its policy designations for the area. The coastal waters south of Rock Island are designated as Type 2 waters (Low Intensity use), while the area north of Rock Island (Pawtuxet Cove) is classified for Type 3 High Intensity Boating uses. Existing city zoning in this area would probably permit some expansion of marine uses. This potential expansion should be evaluated for its suitability. Maintenance, expansion dredging and disposal is an issue as in some of the other cove areas in the city.

**Historic Preservation** - This coastal stretch is one of the most significant historic areas. Many individual sites, as well as the area itself, are important to the City's heritage. Coastal policy needs to address this issue in this area especially. The proximity to Cranston's Pawtuxet area warrants community cooperation and discussion in developing coastal policy here. The establishment of a historic zoning district for a portion of this area in cooperation with Cranston should be explored.

## Other Issues

### Zoning

In 1988, the City of Warwick acted on the recommendations of its 1986 Land Use Plan by adopting a new zoning ordinance. The new ordinance sought to rectify the shortcomings of the 1957 ordinance within the limitations of the then existing state enabling legislation. The 1957 ordinance reflected the rapid growth occurring at that time (for example, there was no minimum lot size requirement for commercial and industrial uses). Although there was no Master Plan or Land Use Plan, the City's policy was to encourage growth and build the tax base. Given the circumstances of the Post War Era, this pro-development policy was considered appropriate. However, until 1988 the city had attempted to make do with what became an obsolete piece of

legislation. As a result, changes to the ordinance or zoning map were piecemeal in nature.

This piecemeal, ad-hoc approach to land use regulation carried a high price (see strip development section in this chapter). The policy that was appropriate in 1957 had fallen far short of the city's needs by 1988. The 1988 overhaul of the zoning ordinance attempted to address the problems fostered by the 1957 ordinance by developing a balanced policy that was neither pro-development nor anti-growth.

While the 1988 ordinance was a vast improvement over previous legislation, it still had to operate within the limitations imposed by the then current state enabling legislation. The recent passage of Title 45, Chapter 24 provides new, more innovative state enabling legislation for zoning. For Warwick this means that the city has the opportunity to carry the innovations of the 1988 ordinance further and create a truly sophisticated tool for guiding Warwick's future growth.

**Zoning text** - There are a few specific problems with the current ordinance. Some of the more important criticisms are listed below:

- There are development incentives such as "PDR" and "cluster" which allow density increases with little or no benefits to the city.
- "In-law" apartments are not specifically defined or regulated by the ordinance.
- The use table under Section 300 is not sufficiently descriptive (an example is laboratories. Only R & D labs are defined by the ordinance).
- Landscape requirements are quite limited and there is no tree preservation ordinance.
- Fence requirements are quite limited

**Zoning Map** - Some of the more important mapping concerns are listed below:

- There are increasing shortages of land zoned for industrial and commercial use.
- There are no zoning designations for railroad tracks and right-of-ways.
- There is no airport-commercial or airport-industrial zones (for airport related uses such as avionics or air express parcel services).

In summation, it can be stated that the major zoning issue facing the city is whether or not it can adopt a new ordinance and revised map, which will allow for appropriate new growth and redevelopment while adequately protecting and enhancing residential neighborhoods and environmentally sensitive areas. Equally important will be whether or not the city (City Council, Planning Board, and Zoning Board) can come to terms with the need for comprehensive planning, which will require a major rethinking of land use policy.

## **Airport**

In terms of Warwick land use, the Airport is an immensely important and complex topic. No doubt, the city would be best served by separate and exhaustive studies of the Airport, as has been the case in the past. This brief section will attempt to highlight some of the more crucial issues attributed to this state facility. These concerns are presented below:

**City Control** - Perhaps the most significant and overriding issue, is the question of city control and involvement or lack of it in Airport related matters. With the State's establishment of an Airport Corporation in 1993, the city has an opportunity to provide significant input into how T.F. Green is operated. Through its representative on the corporation's board, Warwick now has a voice in airport operations and planning. This is in addition to the headway made by the city on the issue of compensation (see discussion below.)

**Compensation** - In the spring of 1986, the city successfully negotiated an agreement with state officials. The agreements called for state compensation to the city for city services rendered for police and fire protection and for any inconvenience suffered as host community. The accord also provided that the city would be party to all new contract negotiations (with airlines, concession operators, etc.) to ensure that Warwick would receive some continued compensatory funding. The city should be applauded for this settlement particularly since "lost revenue" or compensation is a tangible, real concern. The obvious question for the city will be whether or not this negotiation process will be successful in the future.

There is another side to the compensation issue. While reimbursement allows the city to recoup some of its financial loss, it does not address the need to preserve the City's quality of life. The concern here will be whether or not the city can institute a process which allows for more input on noise control, traffic congestion, and related "livability" issues.

**Noise** - Aircraft noise, without question, is the most detrimental impact to residential neighborhoods and businesses alike. By 1998, under a Federal Aviation Agency (FAA) regulation, all aircraft must be equipped with the latest in noise reduction technology. On the surface, these regulations could go a long way in making the Airport more compatible with its surrounding environment.

There are two major issues that the city should consider. First, the question of the city monitored compliance in addition to the FAA, should be addressed. The city will be in a more

advantageous position if it has input into this process. Secondly, the question of requested time extensions by the airlines in order to meet new regulations could delay relief for the people of Warwick. Once again, more direct input by the city would probably help to expedite matters and ensure meaningful results.

**Facilities Expansion** - The State is currently proceeding with plans to enlarge terminal and parking facilities. State officials explain that current space does not adequately meet Airport requirements. Preliminary plans, at this time, envision additional land takings (for terminal expansion and parking facilities) of non-residential properties between Post Road and the Airport. The issues the city will likely focus on are: more loss of taxable property, impacts to the city in terms of the potential for more flights, noise, and traffic congestion.

**Economic Development** - Although the city often finds itself in a defensive position, it might want to consider capitalizing on the fact that the Airport is situated within its boundaries. The issue will be how to maximize the location of the Airport as a business, an industry, and a tourism benefit without adding to the neighborhood detriment.

**Airport Zoning** - Title 1, Chapter 3 of the Rhode Island General Laws provides authority to communities to regulate construction within so-called airport approach plans. These are areas abutting an airport where buildings, structures or landscaping over a certain height or structure that emits radio frequencies (i.e. power lines, radio antennas) could pose a danger to aircraft approaching or leaving the airport. As part of its overhaul of the 1988-zoning ordinance, the City will be incorporating language to regulate "airport hazards" around T. F. Green Airport.

### **Fresh Water Resources**

The city contains 14.2 square miles of ponds, streams, and wetlands. These are discussed in terms of their value and incidence in Chapter IV of this study. State regulatory policy protecting these areas (Rhode Island Fresh Water Wetlands Act and Coastal Resources Management Program) is also discussed in this chapter. Existing Warwick land use policy does not fully recognize the value of fresh water resources. Such a lack of policy could ultimately promote the denigration of their value for aesthetic, recreational, wildlife, flood control, and drainage uses.

Policy issues relating to fresh water resources are centered on questions about recognition of their value, determining the degree to which we wish to protect our freshwater wetland areas, establishment of buffers protecting these areas, reiterating state policy on a local level and development of policy ensuring the continued viability of these areas in the future.

**Open Space/Conservation**

The need for Warwick to preserve remaining open space and agricultural areas in the city is an important issue for consideration in formulating land use policy. Open space in the city has become a dwindling resource. Additionally, various city and state owned open space areas are zoned for residential use. This too is an issue for policy resolution. Additional acquisition of areas by the city if possible, establishment of a land trust, or other methods to promote open space in the city are also considerations for land use policy.

**Public Facilities**

The provision of public facilities in the City of Warwick is a substantial issue that merits detailed consideration in an individual Master Plan element. However, the availability of public facilities and services does have an impact on land use planning and raises several issues for policy consideration.

In general, public water and power are available throughout the city and does not represent significant issues for land use policy planning. Storm drainage facilities and sanitary sewers, however, are not in place in all areas of the city and present land use issues for policy consideration. The city presently has no formalized system of storm water management facilities. Many areas of the city experience drainage related problems due to this deficiency. Funding for drainage improvements is limited and usually is targeted to the worst existing problems. Drainage management policy is therefore a major concern for land use policy development. Other related issues of on-site stormwater management requirements are: pavement limitation, site design considerations, and cognizance of the natural drainage characteristics of Warwick.

As stated above, sanitary sewers are not available throughout Warwick. In fact, many significant areas are only served by on-site sewage disposal systems. Recent extensions of the municipal system have been targeted to areas where numerous failures have occurred or where urban densities have prompted their necessity. Currently, the city has no immediate plans to extent its system beyond its present configuration. However, it should be noted that recently private concerns have extended the city system at their expense to serve new developments. Currently, a plan for private sewer extension into the Warwick Neck area is being considered. The sanitary sewer system in the city raises several policy issues for land use planning. These are: density concerns in the areas with sewers as well as those without sewers, private extension of lines relative to the setting of public policy and system capacity as well as future system planning.

## CHAPTER 6

### CARRYING CAPACITIES

This chapter provides general projections for minimum land use requirements (acreage) for residential, commercial, and industrial uses over the next five-year period (to 1991). Of course, additional sector growth may occur due to unexpected economic, social, or other circumstances. The projections are merely intended to identify minimum land requirements for future anticipated growth.

#### Residential

To anticipate the minimum amount of acreage the city will need for residential construction, the minimum number of new dwelling units must be calculated. Using population projections, the following table presents this data. The basis for the population projection is the buildout analysis discussed in Chapter 8.

This analysis was prepared as part of the development of the Land Use Element and involves a buildout analysis of Warwick's undeveloped and underdeveloped land. Using the land consumption figures derived from the buildout, it was possible to estimate the future population of Warwick. Statewide projections<sup>31</sup> for persons per household were multiplied by the projected number of lots to be developed in the city in a ten-year period resulting in the projected population increase for the decade. A constant per household figure of 2.3 was assumed beyond the year 2010. The median yearly figure for natural increase over the last 9 years was 133 people. An adjusted figure for natural increase was added to the total population increase.<sup>32</sup> Also considered was Warwick's large supply of entry level housing, which serves as an attraction to the region's newly forming households who are seeking that first house.

**Table 20**  
**City of Warwick**  
**New Dwelling Units Required, 1990-2000**

Year	Population <sup>1</sup>	Estimated Increase	Persons Per Dwelling Unit	Minimum New Units Required
1990	85,427	--	--	--
2000	93,810	8,383	2.4 <sup>2</sup>	<b>3,492</b>

Notes

<sup>1</sup> As stated earlier, changes in the birth rate or particularly the migration rate could alter population projections, which would affect the minimum number of new units required.

<sup>2</sup> Statewide projections, Department of Administration.

It is necessary to further adjust the minimum new units required by considering the annual loss of units and vacancy rates. This information is supplied in the table below.



**Table 21**  
**City of Warwick**  
**Adjusted, Minimum Housing Requirements, 1990-2000**

<b>Minimum New Demand</b>	<b>3,492</b>
<b>Annual Loss<sup>33</sup></b>	<b>114</b>
<b>Vacancy Rate<sup>34</sup></b>	<b>167</b>
<b>Total minimum required units</b>	<b>3,773</b>

Notes

<sup>1</sup> The average number of units razed for the last five year period, 1981-1985, was 11.4. It was assumed this average would remain constant between 1990 and 2010.  $11.4 \times 10 \text{ years} = 114$ .

<sup>2</sup> The 1990 U.S. Census vacancy rate for the city was 4.8%.  $4.8\% \times 6,542 \text{ units} = 314$ .

Source: City of Warwick, Department of City Plan

Assuming the city needed no less than 3,773 residential units to keep pace with expected population growth estimated minimum acreage requirements could be computed.

**Table 22**  
**City of Warwick**  
**Minimum Acreage Requirements, 1990-2000**

<b>Dwelling Type</b>	<b>Required Units</b>	<b>Existing Units per Acres</b>	<b>Minimum Required Acreage</b>
<b>Single Family</b>	<b>1,373</b>	<b>3.54</b>	<b>387.8</b>
<b>Multi-Family</b>	<b>2,400</b>	<b>12.88</b>	<b>186.2</b>
<b>Total</b>	<b>3,773</b>	<b>--</b>	<b>574.0</b>

Notes:

<sup>1</sup> The actual single family unit increase between 1980-1985 comprised 36.4% of the total dwelling unit increase for that period (see Table 7).  $603 \text{ divided by } 1,657 \text{ equals } 36.4\%$ . Assuming this percentage remains constant between 1990 - 2000, 36.4% or 1,373 single-family units of the total 3,773 will be needed.

<sup>2</sup> 25,255 single-family units in 1985 divided by 7,133 acres of single-family use in 1985 equals 3.54 dwelling units per acre.

<sup>3</sup> The same method was used to determine multi-family needs (two or more units).

<sup>4</sup> 8,346 multi-family units, (two or more units) in 1985 divided by 648 acres of multi-family use in 1985 equals 12.88 units per acre.

Source: City of Warwick, Department of City Plan.

This model used only population projections derived from the Plan's buildout analysis to determine future needs and assumed a constant 2.4 persons per household (dwelling unit). To present a more realistic scenario of what is likely to occur, a model that considers market factors is needed. By using actual unit increase totals between 1980 and 1990, other variables can be accounted for such as: decreasing household size, increased demand for alternative living styles (condominiums and apartments), larger elderly population, spill-over affects of an increasing South County population, speculation, and the always difficult to predict, migration rate. The

table below illustrates what acreage needs are likely to be, if housing increase between 1980 and 1990 remains constant through 2000.

**Table 23**  
**City of Warwick**  
**Projected Minimum Acreage Requirements, 1990-2000**

<b>Dwelling Type</b>	<b>Dwelling Units<sup>1</sup></b>	<b>Existing Units Per Acre</b>	<b>Minimum Required Acreage</b>
Single-Family	1,762	3.54	497
Multi-Family	1,051	12.88	81
<b>Total</b>	<b>2,813</b>	<b>--</b>	<b>578</b>

<sup>1</sup> As stated, the actual unit increase between 1980 and 1990 is assumed to remain constant through 2000, see Table 7 in Chapter III.

Source: City of Warwick, Department of City Plan

Table 1 in Chapter 3 reported a total of 4,826 vacant acres. The City of Warwick Inventory of Vacant Commercially and Industrially Zoned Land (November 1985) reported that there were 760 acres of such land. As a result, by the end of 1985, there were 4,066 acres of vacant land zoned for residential use. However, fifteen percent of this total must be discounted for new streets and undevelopable acreage (land with severe constraints). A revised figure would be 3,456 vacant, developable acres (with residential zoning). It can be clearly recognized that under either scenario in Tables 1 or 3 there is more than adequate capacity (in terms of acreage), to accommodate minimum or anticipated residential growth over the next five years and well beyond.

### **Commercial**

From the buildout analysis prepared in 1990, it was learned that there were only 103.2 acres of vacant land zoned for commercial or office use in the city. As noted in Table 1 in Chapter 3, there was a 491-acre increase in commercial use between 1972 and 1985 or an average yearly increase of 38 acres. From 1985 to 1990 this rate of consumption slowed to 20 acres per year. Using this historical trend average, commercial acreage needs can be determined to 2000.

**Table 24**  
**City of Warwick**  
**Minimum Commercial Acreage Required (based on yearly average), 1990-2000**

<b>Acre Per Year Increase</b>	<b>Time Period</b>	<b>Minimum Required Acreage</b>	<b>Available Acreage</b>
20 acres	10 years	200 acres	103.2 acres

Source: City of Warwick, Department of City Plan

Under this scenario, almost all available vacant acreage zoned for commercial and office use would be consumed by 1995.

Another method of predicting commercial land needs, considers recent employment increases and current commercial density (employees per acre). To determine the existing density (end of 1985), the total commercial employment sector is divided by total commercial acreage.

**Table 25**  
**City of Warwick**  
**Commercial Density, 1985**

Total Commercial Employment	Acreage in Use	Employees per Acre
22,626 <sup>1</sup>	1,467 <sup>2</sup>	15.4

Notes:

<sup>1</sup> Total commercial employment is derived from four sectors: 1) Retail 2) Wholesale 3) Services 4) Finance, Insurance and Real Estate. See the City of Warwick Economic and Fiscal Trends: 1970-1985 Study Table 2.1 for this data.

<sup>2</sup> See Table 1 in this study.

Source: City of Warwick, Department of City Plan

If these employment sectors increase in employment from 1987 to 1991 at the same rate they increased from 1980-85, the city will need to accommodate at least an additional 3,483 workers.<sup>35</sup> To determine acreage needs this employment increase is divided by the commercial density derived in Table 25 (see Table 26).

**Table 26**  
**City of Warwick**  
**Minimum Commercial Acreage Required (based on employment), 1990-2000**

Employment Increase	Employees Per Acre	Minimum Required Acreage	Available Acreage
6,966	15.4	452 acres	103.2 acres

Source: City of Warwick, Department of City Plan

In this scenario, the city will run out of vacant land zoned for commercial use before 1995. The Land Use Plan: 1986-1991 identifies 197 acres of commercial land and 461 acres of industrial land, which are suitable for commercial development in the City of Warwick. Figures used in this plan were derived from the City of Warwick Inventory of Vacant Commercially and Industrially Zoned Land, 1985.

City planning staff identified parcels that had been developed subsequent to the 1985 inventory.

Of the 219 acres of commercial land in the City approximately 103 acres remain undeveloped. Twenty-three percent of this land is zoned office and 78 percent is zoned general business. Since 1985, 116 acres of commercial land has been developed in some way.

Commercial land in the past six years has been developed at a rate of 20 acres per year, suggesting a much slower rate than was forecasted in the Land Use Plan 1986-1991. Historical trends show on average that 38 acres of commercial land was being developed each year. The City will not have a shortfall of commercial land by 1992 as was indicated in the 1986 plan. Using the update 5-year average of 17.1 acres per year, Warwick's commercial land could be developed by 1996.

Therefore, more land may need to be zoned for commercial use in the next five years. The obvious issue to be addressed is the question of appropriate commercial land use policy, especially in light of the strip development concern.

### Industrial

The vacant land inventory also provided the number of unused acreage with industrial zoning or a balance of about 542 acres. To get a "ballpark" estimate of the amount of usable vacant industrial land, a 15 percent reduction is necessary. This allows for a revised total of approximately 461 developable acres. From Table 2 in Chapter 3, it was determined that the city added 214 acres of industrial land between 1972 and 1985 or an average yearly increase of 16.5 acres. Table 6.8 projects how much acreage will be needed if this yearly average remains the same to 1991.

**Table 27**  
**City of Warwick**  
**Minimum Industrial Acreage Required (based on yearly average), 1987-1991**

Acre Increase	Per Year	Time Period	Minimum Required Acreage	Available Acreage
16.5 acres		5 years	83 acres	461 acres

Source: City of Warwick, Department of City Plan

Another method of predicting land requirements looks at existing industrial density and recent industrial floor space added. By using 1985 total industrial employment (See Table 1, Manufacturing Sector, in Trend study), current density can be derived (See Table 28).

**Table 28**  
**City of Warwick**  
**Industrial Density, 1985**

Total Industrial Employment	Acreage in Use	Employees Per Acre
8,067 <sup>1</sup>	485 <sup>2</sup>	16.6

Notes: <sup>1</sup> Total manufacturing employment in 1985 see the Trend study,  
<sup>2</sup> See Table 1 in this study.

Source: City of Warwick, Department of City Plan

To determine acreage needs by using this method, it is necessary to use floor space added instead of employment increase in the industrial sector. As stated earlier, manufacturing employment has actually declined although industrial acreage has risen. The table below projects industrial acreage requirements assuming that over the next five year period, the rate of floor space added between 1980-1985 remains constant to 1991.

**Table 29**  
**City of Warwick**  
**Minimum Industrial Acreage Required**  
**(based on floor space) 1987-1991**

Floor Space Added	Floor Area Per Employee	New Employees	Minimum Required Acreage	Available Acreage
348,178 sq.ft. <sup>1</sup>	300 sq.ft. <sup>2</sup>	1,161 <sup>3</sup>	70 acres <sup>4</sup>	461 acres

Notes:

<sup>1</sup> Floor space added equals average industrial floor space added per year between 1980 and 1985 x 5 years, (1987-1991).

<sup>2</sup> This standard is taken from The Fiscal Impact Handbook.

<sup>3</sup> Floor space added divided by floor area per employee.

<sup>4</sup> Required acreage equals new employees divided by industrial density, see the above table.

Sources: The Fiscal Impact Handbook, Robert W. Burchell, David Listokin and others, Center for Urban Policy Research, New Brunswick, New Jersey, 1978, Page 138. City of Warwick; Department of City Plan.

In the near future, there would seem to be an adequate supply of developable, vacant land zoned for industrial use. However, at the present rate of growth (and under current zoning) the city would begin to experience a severe shortage in about twenty-five or thirty years. Although the problem of diminishing land is more crucial in the commercial sector, sound industrial policy is needed as well.

## Summary

The carrying capacities discussed in this chapter should be viewed as approximations or general, "ballpark" guides to development scenarios. It must be remembered that the carrying capacity models do not consider the re-use or expansion of existing sites (such as Leeson) which would obviously diminish some of the impact of these apparent land shortages.

## **CHAPTER 7**

### **POLICY RECOMMENDATIONS**

This chapter presents in detail the policy recommendations of the Land Use Plan. Before policy is discussed, it is helpful to reiterate the goals and objectives of this plan as stated in Chapter I.

#### **Goals**

To implement and adopt this five-year Land Use Plan that will define land use policy and guide land use decisions.

To accomplish this stated goal, the objectives of the plan are:

#### **Objectives**

To examine past, present, and anticipated future land use trends,

To make efficient use of available land and proper reuse and expansion of existing land uses.

To protect, preserve, and enhance residential neighborhoods and environmentally sensitive areas,

To rationally accommodate new industrial, commercial, residential, and other development.

To avoid land use mistakes of the past,

To encourage and promote past, desirable land use practices,

To stimulate and provide new policy direction and land use techniques,

To strike a balance between pro-development policy and an anti-growth policy and,

To provide a policy statement to serve as a reference for land use issues.

#### **Definitions**

Some of the terms used in the policy recommendations and in the legend of the "Future Land Use" map are defined as follows:

**Density** - The degree or intensity of development on a given parcel or parcels of land. In terms of residential use, generally the number of dwelling units allowed per acre.

**Open Space/Conservation** - A recommended new zoning district which would allow for open space, conservation, recreation, forestry, agriculture and other like uses. All city, state, federal and conservation (Audubon or other similar societies) parklands, vacant lands, or similar holdings would be placed in this district. Private landowners would be encouraged to voluntarily

have their property rezoned to this classification. However, a program of voluntary participation would have to be further explored by the city to insure its intended purpose (to preserve open space) and proper administration. Other uses of land in this new Open Space/Conservation district would be prohibited.

**Residential** - It should be noted that the residential designations (explained below), as they appear on the "Future Land Use" Map, depict the pattern of future or preferred single family home densities. Multi-family housing densities are explained below as well.

**Very low density residential** - One dwelling unit per 40,000 square feet of land to one acre (43,560 square feet). Comparable to the existing density of the Residence A-15.

**Low density residential** - Two to three dwelling units per acre. Comparable to Residence A-15.

**Medium density residential** - Four to five dwelling units per acre. Comparable to Residence A-10.

**High density residential** - Six to seven dwelling units per acre. Comparable to Residence A-7.

**Multi-family residential** - Generally, three or more dwelling units per building, including condominiums) - existing multi-family developments are generally color-coded on the "Future Land Use" Map to match or closely match their current density. In other words, an existing multi-family development with a density of more than six or seven dwelling units per acre would be colored brown for high density. A multi-family development with a density of two to three dwelling units per acre would be colored yellow for low density. Most of these developments have been rezoned to allow for such use or to what is now known as Planned District Residential (PDR). These zoning designations will not change (other multi-family developments not zoned for PDR use would be rezoned to an appropriate PDR designation unless otherwise noted in this plan).

However, while the PDR concept, process and districts will not change (some new criteria may be added or some existing criteria revised), it is recommended that the extremely liberal PDR densities be changed to generally conform to the following (or similar) proposed range.

**Table 30**  
**Maximum Allowable Density (on a five-acre parcel)**

<b>District</b>	<b>Existing Zoning Ordinance</b>	<b>Proposed Range</b>
PDR A-7	17 Dwelling units per acre	10-12 per acre
PDR A-10	14 per acre	7-9 per acre
PDR A-15	8 per acre	4-6 per acre
PDR A-40	3 per acre	3 per acre

It should be noted that the largest number in the proposed range for each respective PDR district is the maximum allowed. The more units permitted the greater the public benefits, such as provision for open space, access to the shore, or other amenities beneficial to the welfare of the city. In addition, future rezoning to a PDR district should generally only permit such designation in a like zone. For example, a parcel in an A-15 zone should only be granted PDR A-15 status. In limited instances, where the A-15 parcel abuts or is very near an A-10 zone, a rezoning to PDR A-10 may be permissible (criteria to be established in the zoning ordinance). Furthermore, in calculating allowable density, portions of a lot containing wetlands, excessive slope, or other severe constraints should be deducted from such total lot areas.

**General Commercial** - A general land use designation encompassing all retail, wholesale, heavy commercial, and automotive related uses. The business districts will be revised to include new use and site design standards.

**Office or other low traffic generators** - A recommended new zoning district which would be similar to the current Limited Business (LB) zone. However, it will include new use and site design standards. The general purpose of this district will be to serve as a transition between residential and other non-residential districts (commercial, industrial, institutional, etc.). In addition, this district will help disperse the continuous link of high traffic generating commercial uses along major arterials. Office district uses will be limited to low traffic generators based on criteria to be established in the zoning ordinance. The preservation of residential structures and/or the construction of new offices that are residential in appearance will be encouraged as much as possible where appropriate.

**Waterfront Business** - See the existing City of Warwick, Zoning Ordinance, although new use and site design standards will be required.



**Industrial** - A general land use designation encompassing all industrial uses. New zoning designations, use, and site design standards will be established.

**Public Buildings** - A general land use category designating most governmental facilities but not a recommendation for a new zoning district. Existing zoning will generally remain as is.

**Institutional** - A recommended new zoning district which would allow for a large-scale institutional use on contiguous lots such as health care facilities, non-compulsory educational facilities, and other like uses. The purpose of this district would be to minimize conflicts with abutting or nearby residential areas. It would also allow institutions more flexibility in terms of expansion within identified boundaries. Any institutional use in an institutional zoning district would not be permitted in a residential zoning district. A limited number of properties would be places in this district including the Kent County Memorial Hospital on Tollgate Road, the Community College of Rhode Island off East Avenue and Commonwealth Avenue, the New England Institute of Technology on Post Road, and Johnson and Wales University of Post Road. At the discretion of the City Council (and based upon criteria to be established in the zoning ordinance) other properties may be added into this district from time to time.

**Transportation and Public Utilities** - A general land use category designating all transportation and public utility land uses but not a recommendation for a new zoning ordinance. Existing zoning will generally remain as is.

**Planned Unit Development (PUD)** - A recommended new zoning district that would require a zoning change from the City Council. The purpose of this district (criteria will be established in the new zoning ordinance) will be to encourage development of appropriate large parcels by allowing for a mixture of uses on the same site with flexible site design requirements. It may authorize development, including a combination of land uses (such as residential and commercial, or industrial and commercial). In addition, it may provide for development incentives (such as additional dwelling units) in exchange for benefits that would accrue to the city (such as the preservation or dedication of open space). Like to PDR districts, there would be no pre-designated PUD districts. As mentioned, a zone change petition to the City Council will be required.

**Future Land Use Map** - A map containing the preferred or acceptable pattern of land use and densities to 1991 (see following page). The map reflects the policy recommendations contained in this Land Use Plan. See the map legend for use and density designations. Note that this map has been reduced in size from the original; as such there is no scale indicated.

## **POLICY RECOMMENDATIONS**

To accomplish the stated objectives, and based upon the issue analysis contained in this plan and citizen output, the following policy recommendations are set forth:

### **Residential**

- a. Protect and enhance all residential neighborhoods by prohibiting intrusion of non-residential uses.
- b. Promote residential densities that are compatible with existing uses and densities, environmental conditions, and availability of public facilities.
- c. Develop appropriate criteria for the establishment of high-density use such as condominium and other multi-family uses.
- d. Establish a Planned Unit Development or Mixed Use District (allowing for a mixture of residential and non-residential uses) as a transition between existing residential and commercial or industrial areas or as appropriate.
- e. Require buffers and strict design control standards between residential and non-residential uses.
- f. Minimize neighborhood impact by integrating new development into existing transportation network.
- g. Preserve historical character of residential areas as appropriate by considering the creation of historic zoning districts.

### **Commercial**

- a. New development or redevelopment of commercial areas should not encroach into residential areas.
- b. New or expanded commercial activity should generally be limited to locations within existing business areas.
- c. New or expansion of existing commercial activity can be permitted in designated areas where conflicts with residential or other uses will not occur (i.e. Bald Hill Road/Quaker Lane, see future land map).
- d. Require strict site design control standards for all new and expanded commercial activity.
- e. Establish a Planned Unit Development or Mixed Use District as a transition between existing residential and commercial/industrial areas or to promote development as appropriate.
- f. Establish an office zoning district prohibiting or limiting retail use.
- g. Preserve historical character of commercial areas as appropriate by considering the creation of historic zoning districts.

**Major Arterials**

- a. Strictly control and in many instances prohibit the expansion of commercial strip development along major arterial roadways.
- b. Prohibit the establishment of commercial uses along secondary arterials that are primarily residential or otherwise sensitive in character.
- c. New or expanded non-residential activity should generally be limited to in-fill sites within and along existing business arterials. New or expanded non-residential activity should not encroach into residential or other sensitive areas off arterials.
- d. New or expanded activity can be permitted along major arterials in designated areas where conflicts with residential and other uses will not occur.
- e. Require strict site design standards for all new and expanded non-residential activity along major and secondary arterials.
- f. Encourage the revitalization of existing commercial centers such as Apponaug, Conimicut, and others.
- g. To the extent possible and where appropriate, encourage low traffic generating uses such as office and discourage high traffic generating uses such as retail.
- h. Develop strict guidelines for customary home occupations.

**Major Arterials (Specific)****Post Road****1. Post Road (Pawtuxet Village to Warwick Avenue)**

- a. Prohibit the expansion of commercial activity between the village and Warwick Avenue.
- b. Prohibit the expansion of industrial activity beyond the current boundaries of the Warwick Industrial Park.
- c. Consider the establishment of a historic zoning district in the village area.
- d. Promote densities that are compatible with the surrounding area.

**2. Post Road (Warwick Avenue to State Route 37)**

- a. Prohibit the expansion of commercial activity between Warwick Avenue and the Warwick Plaza site on the south side and Aldrich School property on the north side.
- b. Prohibit the encroachment of non-residential activity into residential areas off Post Road between the plaza and school sites and Route 37.
- c. Require strict site design standards for new or expanded commercial activity. Encourage existing use to consider site design improvements.
- d. Protect Cranberry Bog and Sand Pond by prohibiting incompatible use and density on adjacent sites. Require appropriate setbacks from these areas.

**3. Post Road (State Route 37 to Greenwood Bridge)**

- a. Require strict site design standards for new or expanded commercial activity. Encourage existing uses to consider site design improvements.
- b. Prohibit the encroachment of non-residential activity into residential areas off Post Rd.
- c. Encourage as preferred uses office or other low traffic generating uses.
- 4. Post Road (Greenwich Bridge to Veterans Memorial Boulevard)**
- a. Prohibit the expansion of retail and other high traffic generating use to prevent a continuous linkage of such activity in this area.
- b. Protect Gorton's Pond by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from the pond.
- 5. Post Road (Apponaug)**
- a. Encourage a village concept and revitalization in Apponaug Village by - allowing for a mix of uses, accommodating parking and pedestrian needs, requiring site design standards, considering historical and governmental aspects, and encouraging relocation of incompatible uses.
- 6. Post Road (Centerville Road to Division Street, including Potowomut)**
- a. Maintain the predominant residential character by prohibiting the expansion of commercial activity beyond current locations.
- b. Encourage as preferred uses office or other low traffic generating use within existing commercial areas.
- c. Prohibit industrial use along Post Road in the Apponaug area.
- d. Protect Mary's Creek and Thatch Cove by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from these areas.
- e. Preserve historical character of structures along Post Road in Arnold's Neck vicinity.
- f. Prohibit the expansion of commercial activity along the northern section of Post Road in Potowomut.
- g. Require strict site design standards for new or expanded commercial activity along the southern section of Post Road in Potowomut.
- h. Protect Hunt's River by prohibiting incompatible use and density for sites adjacent to the Hunt's River. Require appropriate setback from Hunt's River.

### **Warwick Avenue**

- 1. Warwick Avenue (Cranston line to Airport Road)**
- a. Require strict site design standards for new or expanded commercial activity between the Cranston line and Harrison Avenue (both east and west sides). Encourage existing line uses to consider site design improvements.
- b. Maintain the predominant residential character by prohibiting the expansion of

commercial activity between Harrison Avenue and Independence Drive (both east and west sides).

- c. Require strict site design standards for new or expanded commercial activity between Independence Drive and Airport Road. Encourage existing uses to consider site design improvements.
- d. Encourage as preferred uses office or other low traffic generating use within existing commercial areas south of Post Road.
- e. Protect the Pawtuxet River, Posnegansett Lake, and Spring Green Pond (including land across from the pond) by prohibiting incompatible use and density on adjacent sites. Require appropriate setbacks from these water systems.

**2. Warwick Avenue (Airport Road to Sandy Lane)**

- a. Require strict site design standards for new or expanded commercial activity north of Lakeside Drive to Airport Road (both sides) and south of Old Warwick Avenue to Sandy Lane (both sides). Encourage existing uses to consider site design improvements.
  - b. Prohibit expansion of commercial activity between Lakeshore Drive and Old Warwick Avenue by maintaining residential zoning where it now exists.
  - c. Protect Buckeye Brook (on both east and west sides of Warwick Avenue) by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from the brooks.
- 3. Warwick Avenue (Sandy Lane to West Shore Road)**
- a. Prohibit the expansion of commercial and industrial activity beyond existing locations.
  - b. Protect the Warner and Parsonage Brooks by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from the brooks.

**West Shore Road**

**1. West Shore Road (Warwick Avenue to Church Avenue)**

- a. Prohibit the expansion of commercial activity between Warwick Avenue and Conimicut Village.
- b. Encourage a village concept and revitalization in Conimicut Village by: allowing for a mix of uses, accommodating parking and pedestrian needs, requiring site design standards, considering historical aspects, and encouraging relocation of incompatible uses.
- c. Prohibit the expansion of commercial activity beyond commercially zoned properties between the village and Church Avenue.
- d. Protect Lockwood Brook and the stream across from Spring Green Pond by prohibiting

incompatible use and density on adjacent sites. Require appropriate setbacks from these water systems.

**2. West Shore Road (Church Avenue to Oakland Beach Avenue)**

- a. Prohibit the expansion of commercial activity beyond its current boundaries.
- b. Protect the Buckeye Brook habitat and Parsonage Brook by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from the brooks.

**3. West Shore Road (Oakland Beach Avenue to Wildes Corner at intersection with Sandy Lane)**

- a. Prohibit the expansion of commercial activity in the existing residential section on the south side of West Shore Road, generally between Taplow Street and Hawksley Ave.
- b. Require strict site design standards for new or expanded commercial activity. Encourage existing uses to consider site design improvements.
- c. Encourage as preferred uses office or other low traffic generating use within existing commercial areas.

**4. West Shore Road (Wildes Corner to Post Road in Apponaug)**

- a. Prohibit the expansion of commercial or industrial activity beyond current locations.
- b. To discourage commercial expansion beyond existing sites, carefully limit and regulate customary home occupations.
- c. Protect the Tuscatucket Brook by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from the brook.

**Bald Hill Road**

- a. Require strict site design standards for new or expanded commercial activity. Encourage existing uses to consider site design improvements.
- b. Designate areas as appropriate for commercial use (see future land use map).
- c. Discourage industrial use along Bald Hill Road and Quaker Lane.
- d. In some locations a planned unit development district may be appropriate allowing for a mixture of residential and commercial uses.

**Jefferson Boulevard**

- a. Designate areas as appropriate for industrial use.
- b. Generally prohibit non-industrial uses along Jefferson Boulevard such as residential, commercial, institutional and other inappropriate uses. Office or other related uses customarily associated with industrial activity may be permitted.
- c. In some locations a planned unit development district may be appropriate allowing for industrial use and limited commercial uses.

- d. Require strict site design standards for new or expanded industrial activity. Encourage existing uses to consider site design improvements.
- e. Encourage preservation of the historic duplex style mill structures along Jefferson Boulevard.
- f. To the extent possible, assist residents along Jefferson Boulevard who wish to relocate.
- g. Maintain existing zoning at Wethersfield Commons.
- h. Protect the Three Ponds and the Pawtuxet River (from further denigration) by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from these water systems.

### **Centerville Road**

- a. Maintain the predominant residential character by generally prohibiting the expansion of commercial activity beyond current locations.
- b. In some instances and where appropriate (such as the Interstate Route 95 interchange and Apponaug vicinity) designate land for office use.
- c. Require strict site design standard for new or expanded commercial activity. Encourage existing uses to consider site design improvements.
- d. Consider a planned unit development designation for the Apponaug Mill site that could allow for a mixture of residential and non-residential uses.
- e. Except as noted above, discourage industrial use along Centerville Road.

### **Greenwich Avenue and Lambert Lind Highway**

- a. Maintain the predominant residential character between Apponaug and Main Avenue by limiting such expansion of commercial activity to areas immediately adjacent to existing commercial areas, and by providing that such expansion does not result in increased strip commercial frontage development along these arterials, and provided appropriate setbacks and/or screening are established; and further, provided, that such expansion does not occur on existing developed residential land. No additional retail uses shall be developed along Greenwich Avenue between Apponaug and Main Avenue except for retail uses ancillary and customarily related to an office or hotel and/or golf use.
- b. Require all new or expanded non-residential activity to conform to strict site design standards including the incorporation of substantial natural buffers and to provide benefit which may include improvements to recreational facilities, public utilities, roadways and traffic circulation.
- c. To discourage commercial expansion beyond existing sites between Main Avenue and Apponaug, carefully limit and regulate customary home occupations.

- c. Require strict site design standards for new or expanded commercial activity. Encourage existing uses to consider site design improvements.
- d. Prohibit the encroachment of non-residential activity into residential areas off Greenwich Avenue and Lambert Lind Highway between the Cranston line and Main Avenue.
- e. Protect the Pawtuxet River, Gorton's Pond, and Little Gorton's Pond by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from these water systems.

### **Main Avenue**

- a. Maintain the predominant residential character by prohibiting the expansion of commercial activity beyond current locations.
- b. To discourage commercial expansion beyond existing locations, carefully limit and regulate customary home occupations.

### **Tollgate Road**

- a. Designate the area between Centerville Road and Commonwealth Avenue for mainly office use while still respecting pockets of residential use.
- b. Prohibit expansion of commercial activity beyond current locations between Commonwealth Avenue and the West Warwick line.

### **Airport Road**

- a. Prohibit the expansion of retail or other high traffic generating uses between Warwick Avenue and the Airport Property.
- b. To minimize traffic congestion between Warwick Avenue and the Airport property, carefully limit and regulate customary home occupations.
- c. Require strict site design standards for all new and expanded commercial activity. Encourage existing uses to consider site design improvements.

### **Division Street**

- a. Prohibit encroachment of non-residential activity into residential areas off Division Street between Greenwich Cove and Post Road.
- b. Prohibit the expansion of commercial activity between Post Road and east of the State Route 4 interchange.
- c. Preserve historical character of structures between Love Lane and Post Road.
- d. Protect the Maskerchugg Brook and Dark Entry Brook by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from these water systems.



**Sandy Lane**

- a. Prohibit the expansion of commercial activity beyond current locations at Wilde's Corner and Warwick Avenue.
- b. Prohibit the encroachment of commercial activity into residential areas and around the City's sports complex off Sandy Lane near Wilde's Corner.

**Elmwood Avenue**

- a. Require strict site design standards for all new and expanded non-residential activity. Encourage existing uses to consider site design improvements.
- b. Discourage industrial use along Elmwood Avenue.
- c. Limit the expansion of heavy commercial uses by rezoning areas as appropriate for office use.
- d. Prohibit the encroachment of non-residential activity into residential areas off Elmwood Avenue.
- e. Protect the Pawtuxet River from further denigration by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from the river.

**East Avenue**

- a. Prohibit the expansion of commercial activity beyond current locations.
- b. Discourage commercial expansion by carefully limiting and regulating customary home occupations.
- c. Preserve historic duplex style mill structures along East Avenue.
- d. Protect the Pawtuxet River from further denigration by prohibiting incompatible use and density on adjacent sites. Require appropriate setback from the river.

**West Natick Road**

- a. Prohibit the expansion of commercial activity beyond current locations.
- b. Prohibit the encroachment of commercial activity into residential areas off West Natick Road.

**Oakland Beach Avenue (north of West Shore Road)**

- a. Prohibit the expansion of commercial activity beyond current locations.

**Coastal (general)****Land Use and Density**

- a. Recognize and adopt the policies put forth by the State of Rhode Island, Coastal Resources Management Council (CRMC), see Chapter IV.
- b. Correlate local zoning regulations with Coastal Resources Management Council policy designations (Type 1 Waters - Type 5 Waters).
- c. In conjunction with "b" above, zoning regulations and designations should be changed to promote densities, use, and dimensional requirements (buffers, setbacks, etc.) compatible with the coastal environment.
- d. Where development is feasible, the use of cluster development techniques should be utilized to minimize impacts to the coastal area.
- e. Changes to local regulations affecting coastal land use should encompass at a minimum a 200-foot boundary (measured inland from the coastline or significant coastal feature).
- f. All Federal, State and Municipal land in the coastal area should be designated as Open Space/Conservation.

**Pollution/Water Quality**

- a. Maintain and enhance water quality ratings set forth by the State of Rhode Island Department of Health and Department of Environmental Management.
- b. Minimize surface run-off in coastal areas by limiting impervious lot coverage and encouraging on-site runoff management.
- c. Require lower densities of development in coastal areas, especially for those areas not served by municipal sewerage.
- d. Encourage as a high priority the installation of municipal sewerage or tie-in where facilities are now in place within existing high-density coastal areas. This plan recognizes the limits of the current City Wastewater Facilities Plan. However, to the extent possible, this recommendation should be given serious consideration.
- e. Any proposed dredging should carefully consider disposal of dredged material and effects on water quality.

**Shore Access**

- a. Adopt, maintain, and update an official listing of shore access points within the City (such as the recently completed City of Warwick, Department of City Plan, Rights of Way Inventory, 1986).
- b. Determine and designate the level of use of rights of way and related access points.
- c. Maintain and permanently mark as appropriate all shore access points.

- d. Institute a program of public education and awareness concerning availability and use of shore access areas.
- e. New development along the coast should consider access to the shore for users of the total development and if possible, others in the vicinity.

### **Marine Commerce**

- a. Expansion of existing or establishment of new commercial marinas should occur only in areas designated for such activity by the Coastal Resources Management Council.
- b. Prohibit non-marina uses (i.e. residential) in areas of established marina activity.
- c. Allow and, in some instances, encourage dredging of areas designated for such activity by the Coastal Resources Management Council.
- d. Prohibit dredging activities in areas deemed unsuitable by the Coastal Resources Management Council.
- e. Ensure that dredging activities minimize any threat to shellfish and fishing habitats.
- f. Encourage shoreline land use patterns that do not threaten valuable shellfish and fishing habitats.

### **Historic Preservation**

- a. Preserve historical character of coastal areas as appropriate by considering the creation of historic zoning districts.

### **Coastal (Specific)**

#### **Area I, Potowomut**

- a. Private coastal lands between Potowomut Bridge and Sandy Point (property south of Ives Road) should be designated for very low-density residential use.
- b. Private coastal lands between Sandy and Sally Points should be designated for low-density residential use.
- c. Those private coastal properties between Sally Point and where Greenwich Cove abuts the Railroad and Forge Road should be designated for very low-density residential use.
- d. State or municipally owned coastal recreation and conservation areas in Potowomut should be designated as Open Space/Conservation.

**Area II, Southern Coastal** - area bounded by Division Street on the south and running northerly to, but not including, Masthead Drive.

- a. The area between Division Street and Ocean Point Road east of the railroad tracks should be designated for Waterfront Business use. New density and design standards should be

required for this district.

- b. The coastal area west of the tracks roughly between Williams Street and Ocean Point Road should be designated for medium density residential use.
- c. The area from north of Ocean Point Road to just south of Folly Landing, excluding Chepiwanoxet, should be designated for low-density residential use.
- d. The Chepiwanoxet peninsula, which is now in City ownership, should be zoned and maintained as open space.

**Area III, Apponaug Cove** - includes Masthead Drive to, and including, the whole of Mary's Creek, Thatch Cove, and around the Apponaug Cove perimeter to Darrow Drive off Oak Tree Avenue.

- a. The area north of Masthead Drive up to within 200-feet of Mary's Creek should be designated for Waterfront Business. Marina expansion is encouraged if possible, with appropriate setback and protection of the creek.
- b. The area of Mary's Creek and Thatch Cove should be designated for very low density residential use. This would include the entire area of "Type 1" Coastal Resources Management Council designation.
- c. The area from the southern portion of Arnold's Neck, where Midgely Road turns northeast, including around the Apponaug Cove perimeter up to the existing zoning boundary line separating light industrial from residential A-10 (just west of Dory Road); should generally be designated for Waterfront Business or medium density residential use (see "Future Land Use" Map).
- d. In the Apponaug area, encourage clustering of residential development and planned unit development allowing for a mix of uses fostering the creation of a village concept.
- e. Encourage the relocation of incompatible land uses to other more appropriate locations.
- f. Maintain existing use and medium density designation between the area just west of Dory Road and Darrow Drive.
- g. Encourage maintenance dredging to support continued operation of existing marinas and to allow for potential expansion of marina and marine-related activities.
- h. Overall, pursue avenues to create a village concept encompassing the historical, governmental, residential, commercial, and marine commerce character of Apponaug.

**Area IV, Nausauket/Buttonwoods** - Darrow Drive to, but not including, Brush Neck Cove.

- a. The area between Darrow Drive and Cedar Tree Point should be designated for medium

- density residential use. Encourage the use of cluster development techniques.
- b. The area between Cedar Tree Point and Nausauket Road should be designated for low-density residential use.
  - c. The city property known as Nausauket Beach should be designated for Open Space/Conservation.
  - d. The undeveloped barrier beach along Baker's Creek, which is part of the Shriner's property, should be designated for very low-density residential use. The remainder of the coastal frontage of the Shriner's land should be designated for low-density residential use.
  - e. The area from east of the Shriner's property to east of 15th Avenue (in Buttonwoods) should be designated for low-density residential use.
  - f. The area from east of 15th Avenue to the tip of Buttonwoods (classified as an undeveloped barrier beach by the CRMC) should be designated for very low-density residential use.

**Area V, Buttonwoods/Brush Neck Cove Vicinity** - The area includes Brush Neck Cove from Buttonwoods tip to and including City Park around the cove to Canfield Avenue off West Shore Road.

- a. Except for City Park and other municipal land in this area, land should be designated for very low-density residential use.
- b. City Park and other municipal properties should be designated for Open Space/Conservation uses only.
- c. To protect the water quality, recreational and aesthetic values of this area, extension of sewer lines to existing high-density areas on the northwest side of the cove should be given a high priority.
- d. Establishment of commercial marina uses in this area should be prohibited.

**Area VI, Oakland Beach** - The area between Canfield Avenue to, and including, the city beach at Oakland Beach.

- a. Despite the existing medium and high density residential use, the area between Canfield Avenue and just past Strand Avenue north of the beach should be designated for very low density residential use (private property) or Open Space/Conservation (city land) in order to protect the water quality, recreational and aesthetic value of Brush Neck Cove.
- b. The City Beach at Oakland Beach should be designated Open Space/Conservation.
- c. Expansion of marina activity or establishment of new marinas should be prohibited in this area (all of Area VI).
- d. Encourage tie-in to existing municipal sewerage system, particularly for high-density

areas.

**Area VII, Warwick Cove** - includes from the beach at Oakland Beach around the Warwick Cove perimeter to Randall Avenue on Warwick Neck.

- a. Except for the "Type 1" coastal wetland areas along the north shore of Warwick Cove, encourage as much as possible marina expansion.
- b. Except for the wetlands areas mentioned above, maintain or expand as appropriate Waterfront Business designations.
- c. Designate existing residential areas for medium density development except as noted below.
- d. Designate the four distinctive coastal wetland areas for very low-density residential use.
- e. Encourage tie-in to sewers where facilities are located.
- f. Maintenance dredging should be encouraged where necessary, but not at the expense of the coastal wetland areas.

**Area VIII, Warwick Neck western shore** - includes from Randall Avenue to, and including, Warwick Light.

- a. Existing marina activity just south of Randall Avenue should not expand further south to CRMC "Type 2" waters. As such, there should be no southerly expansion of the existing Waterfront Business zone.
- b. Maintain existing very low-density residential designation except as noted below.
- c. Designate historic Warwick Light as Open Space/Conservation.

**Area IX, Warwick Neck eastern shore** - includes the area from Warwick Light to, and including Rocky Point.

- a. Maintain existing very low-density residential designation except as noted below.
- b. Designate the Rocky Point property for very low density and low-density residential use. Extend the existing zoning boundary line to the north, separating Heavy Commercial from Residential A-10 southerly to a point directly across from Rocky Point Avenue. This portion of the property should be designated for low-density residential use. Designate the 200-foot coastal area within this portion of the property for low-density residential use as well. The remainder of the property should be designated for very low-density residential use including the coastal area. A reuse of this property could utilize planned unit development, cluster development, and other techniques to best suit the large size and natural features of this site.

**Area X, Conimicut South** - includes north of Rocky Point, Bayside Beach, around Mill Cove to the tip of Conimicut Point.

- a. Designate all areas for low-density residential use, except as noted below.
- b. Designate the municipal and state owned properties along Bayside Beach as Open Space/Conservation.
- c. The Mill Cove area classified as CRMC "Type 1" waters should be designated for Open Space/Conservation (public lands) or very low density residential use (private lands).
- d. Private lands near Conimicut Point should be designated for very low-density residential use. City owned property at the point should be designated all Open Space/Conservation.
- e. Installation of sewers to serve existing high-density areas should be given a high priority.

**Area XI, Conimicut North** - includes area northwest of Conimicut Point to, and including, Cole Farm.

- a. Designate area from the tip of Conimicut Point westerly to Talcott Avenue as very low density residential. However, city owned property west of the point should be designated all Open Space/Conservation.
- b. Designate the remainder of this Area XI for low-density residential use, except as noted below.
- c. Designate the area along the northwest side of Cole Farm (where CRMC classification changes to "Type 1" waters) for very low-density residential use.
- d. Installation of sewers to serve existing high-density areas should be given a high priority.

**Area XII, Gaspee Point, Occupasstuxet and Passeonkquis Coves** - includes Occupasstuxet Cove and areas above to just south of Gaspee Point Drive (where the CRMC classification changes to "Type 2" waters).

- a. The entire area is classified as "Type 1" by the CRMC. As such, except as noted below, only very low density residential designations should be permitted.
- b. City or Audubon Society lands along the north side of Passeonkquis Cove should be designated all Open Space/Conservation.

**Area XIII, Pawtuxet** - includes area from north of Gaspee Point Drive to Pawtuxet Village.

- a. State and municipally owned land should be designated only for Open Space/Conservation uses.
- b. Other land within the CRMC "Type 2" area (portion north of Gaspee Point Drive moving northerly to southern edge of Salter Grove and Rock Island) should be designated for low density residential use.
- c. Encourage marina activity and if possible expansion (in CRMC Type 3 waters only) but

- not if detrimental impacts will occur to the residential or historical character of the area.
- d. Encourage maintenance dredging if disposal issues and environmental considerations are resolved (in Type 3 waters only).
  - e. Designate residential land within the CRMC "Type 3" for medium densities.

### **Land Use Regulations**

- a. Rewrite and adopt a comprehensive new zoning ordinance. Selectively re-zone property as necessary to implement policy in this Land Use Plan.
- b. Establish as needed new zoning classifications such as Office, Open Space/Conservation, Institutional and Planned Unit Development districts.
- c. Review and amend as needed local Subdivision Regulations.

### **Development Caps**

The use of annual development caps enables local governments to provide necessary infrastructure to improve land prior to its development. Infrastructure and services required by new development - such as roads, sewers, schools, and police and fire service - placed a financial burden on local government. Annual development caps have become a well-established tool to manage growth, which has been used by numerous communities.

The Town of Petaluma, California implemented a cap on development allowed within town boundaries in 1973. Petaluma's regulation was used as a model by Boulder, Colorado in 1977, when it also enacted an ordinance to limit the number of new dwelling units permitted each year.

Montgomery County, Maryland has been setting annual limits on development since 1986. The County identifies areas in which facilities are not available, and places a moratorium on such areas. Moratoria are lifted at a certain rate per year, based on public improvements. In 1991, the County won two lawsuits that had challenged the moratorium, asserting that it amounted to a taking of the economic value of the property.

A Supreme Court ruling on *Nollan v. South Carolina Coastal Commission* has helped to set a national standard for determining when land use regulations are liable to be considered "takings" under the Fifth Amendment of the U.S. Constitution. In *Nollan*, the Supreme Court ruled that restrictions to the use of property must be directly linked to the project at hand. In the case of capping annual development, there is a clear and quantifiable relationship between the amount of new development and the amount of public infrastructure and services required by such development.



**Airport**

- a. Establish a local Airport Task Force in conjunction with the state to ensure and provide city input into Airport policy.
- b. Support the implementation of the noise abatement and land use measures that have been identified in the Airport Noise Control and Land Use Compatibility Study for T.F. Green State Airport.
- c. Discourage any proposal to expand airport runways.
- d. Utilize the Airport location within the city to promote local economic development efforts.

**Freshwater Resources**

- a. Discourage development in, or alteration of, any wetland areas (as defined by the State of Rhode Island, Freshwater Wetlands Act), unless impacts are insignificant.
- b. Require setbacks from wetland areas at least a minimum distances as prescribed by the State of Rhode Island, Department of Environmental Management.
- c. Discourage point source, storm runoff discharge into wetland areas.
- d. Discourage or minimize installation of culverts in wetland areas.

**Open Space/Conservation**

- a. Establish a new Open Space/Conservation zoning district that would allow for open space, conservation, recreation, forestry, agriculture and other like uses. All city, state, federal and conservation society parklands, vacant lands or similar holdings would be placed in this district.
- b. Encourage preservation of remaining farmlands and other sensitive private open lands through voluntary rezoning to the Open Space/Conservation District.
- c. Encourage municipal acquisition if possible, creation of land trusts, foreclosed right of redemption on unbuildable tax title lots, or other means to preserve open space.
- d. Revise the city Recreation Master Plan to prioritize the use of city recreational lands. This reflects different organized and unorganized uses that compete for use of city recreational lands. Soccer teams compete with Little League baseball teams, ice hockey leagues and swim teams compete for parking space at Mickey Stevens Sport complex, etc. The City must accommodate all these uses in a way that not only allows for equal access but also gives the facilities time to recover from use (i.e. landscaping).

**Public Facilities (Sewerage and Drainage)**

- a. Encourage on-site storm drainage disposal.

- b. Require storm drainage management planning for all new or expanded commercial, industrial, or large-scale residential development.
- c. Develop a municipal storm drainage management plan.
- d. Assign a high priority for expansion of municipal sewerage systems or tie-in to existing systems for high density or other sensitive areas. As stated earlier, this plan recognizes the limits of the City Wastewater Facilities Plan. However, this recommendation should be given serious consideration.
- e. Develop municipal policy to address and prioritize the issue of private expansion of the sewerage system in conjunction with the policy recommendations in this plan.

## **CHAPTER 8**

### **BUILDOUT ANALYSIS**

#### **Preface**

This portion of the land use plan is was prepared in 1990 by Albert Veri & Associates, Inc. and is in large part based on a housing study done in 1990 by graduate students in the Graduate Curriculum in Community Planning and Area Development at the University of Rhode Island. Information in this section is also based partly on findings of the land use survey conducted in 1985.

#### **Introduction**

The buildout analysis is a method of determining how much development is feasible in a given area based on different zoning scenarios and combinations of environmental constraints. Every community has a carrying capacity for development. Theoretically that capacity is reached when every buildable parcel of land is subdivided so that it satisfies the minimum zoning requirements, and is then built on. It is possible for cities, such as Warwick, with a combination large and small lot zoning to reach this theoretical capacity. This analysis assumes a worse case scenario; that all-developable land will be developed through time. However, some buildable land can be expected to remain as open space for its visual quality.

The ability to predict the amount of development that can occur in a town is vital for a city that is attempting the long-range planning of services. Reliable information regarding the development potential of the city is essential for the various departments to plan for increases in service demand. The great expense associated with capital improvements make it necessary for cities to start budgeting for them well in advance of the actual need. Knowing the eventual population of the community, based on the buildout analysis will allow a town to avoid making costly incremental decisions regarding capital improvements. The environmental consequences of reaching buildout capacity can be studied, and if found to be unacceptable changes which affect the amount of development, can be made.

The buildout analysis presents a scenario, based on pre-set assumptions, of the amount and type of development a community can support. The analysis considers existing land use, undeveloped land, developable land, underdeveloped land, number of housing units permitted by current zoning, and the natural capability of the land to support development.

Based upon the amount of available land, the number of housing units or acreage of commercial or industrial space that could potentially develop in a specified area is estimated.

## Residential Land

This section of the buildout examines parcels of land greater than 7000 square feet that are either vacant or partially developed. Partially developed land includes parcels that are occupied by some type of residential or institutional structure. The database compiled for the City by the CPAD studio team was used to identify large and under developed lots. Parcels capable of being subdivided into 5 or more buildable lots had their acreage discounted by 20 percent to account for roads necessary to access the property and for open space. A further discounting of acreage was done on a parcel basis. This additional discounting of acreage took into account placement of structures on parcels, lot configuration, soils and flood hazard. The URI study identified 5,484 buildable lots greater than 7,000 s.f. Discounting acreage for the factors mentioned above reduced this number by approximately 31 percent to 3,893 buildable lots. Most of the reduction in lot numbers can be attributed to odd lot configurations and placement of existing structures on parcels. Table 31 indicates the distribution of buildable lots according to the City's planning districts.

**Table 31**  
**Underdeveloped Buildable Lots > 7,000 sq. ft.**

	A-7	A-10	A-15	A-40	TOTAL	%
<b>DISTRICT 1</b>	<b>169</b>	<b>251</b>	<b>0</b>	<b>11</b>	<b>431</b>	<b>11%</b>
<b>DISTRICT 2</b>	<b>177</b>	<b>360</b>	<b>0</b>	<b>0</b>	<b>537</b>	<b>14%</b>
<b>DISTRICT 3</b>	<b>9</b>	<b>105</b>	<b>0</b>	<b>163</b>	<b>277</b>	<b>7%</b>
<b>DISTRICT 4</b>	<b>129</b>	<b>243</b>	<b>85</b>	<b>5</b>	<b>462</b>	<b>12%</b>
<b>DISTRICT 5</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>.4%</b>
<b>DISTRICT 6</b>	<b>86</b>	<b>102</b>	<b>428</b>	<b>84</b>	<b>700</b>	<b>18%</b>
<b>DISTRICT 7</b>	<b>0</b>	<b>163</b>	<b>601</b>	<b>423</b>	<b>1187</b>	<b>31%</b>
<b>DISTRICT 8</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>273</b>	<b>283</b>	<b>7%</b>
<b>TOTAL LOTS</b>	<b>586</b>	<b>1234</b>	<b>1114</b>	<b>959</b>	<b>3893</b>	

Thirty-one percent or 1,187 lots in this category are found in District 7. The plats in this district have the greatest potential for subdivision activity. Districts 6 comprises approximately 17 percent of the total number of lots and District 2 has close to 14 percent. Many of the large parcels in District 2 are schools or other institutions, which have excess acreage in either, play fields, parking lots or lawn areas.

The following figure shows the distribution of buildable lots by planning district. The highest

percentage of large lots are found in the A-10 zone with 32 percent followed by the A-15 zone with 29 percent, the A-40 zone with 25 percent and the A-7 zone with 15 percent.

The next portion of the buildout analysis examines vacant parcels with area greater than 7,000 s.f. The database compiled by the CPAD Studio Team shows 2,481 lots being divided from 1,833 vacant parcels.

Three hundred seventy parcels had sufficient area to allow division into 2 or more lots. Twenty percent of the lot area from this group were discounted for odd lot configuration, soil constraints and flood hazards. Analysis of the under developed lots in the previous section revealed that at-least 20 percent of a lot's area was lost to odd lot configurations and other constraints. The number of lots derived from 370 parcels was thereby reduced to 1,493. This 20 percent reduction is reflected in Table 32 and Figure 16.

**Table 32**  
**Vacant Buildable Lots From Parcels**  
**With >2 Lots-Reduced 20 Percent**

	<b>A-7</b>	<b>A-10</b>	<b>A-15</b>	<b>A-40</b>	<b>TOTAL</b>
DISTRICT 1	190	98	0	5	293
DISTRICT 2	127	94	0	2	223
DISTRICT 3	158	0	0	50	208
DISTRICT 4	111	47	7	17	182
DISTRICT 5	26	0	0	0	26
DISTRICT 6	135	115	3	0	253
DISTRICT 7	39	95	102	26	262
DISTRICT 8	18	26	0	2	46
<b>TOTAL LOTS</b>	<b>803</b>	<b>475</b>	<b>113</b>	<b>102</b>	<b>1493</b>

The total number of lots from the "underdeveloped lot database" and the >7,000 sq.ft. vacant lot database is 6,001.

#### **Summary**

<b># of lots from underdeveloped parcels</b>	<b>3,893</b>
<b># of lots from single lot parcels</b>	<b>615</b>
<b># of lots from parcels with 2 or more lots</b>	<b>1,493</b>
<b>Total</b>	<b>6,001</b>

Vacant Non-conforming Sequential Lots - Non-conforming lots are defined for the purposes of this study as lots which have less than the required acreage for the zoning district in which they are found. Warwick tax assessor records show 5,220 non-conforming less than 7,000 square feet. Small vacant lots are aggregated into 2 groups, those which are adjacent and have a single owner with sufficient area to combine adjacent parcels, forming buildable lots which conform to zoning, and lots which can be developed without joining adjacent lots. Table 33 and Figure 17 show the distribution of individual vacant lots, < 7,000. The distribution of vacant sequential lots by planning district is shown in Table 34. There are 2,808 non-conforming lots less than 7,000 sq. ft. which are surrounded by developed land and could technically be developed as non-conforming lots of record.

**Table 33**  
**Vacant Lots <7,000 & >3,000 S.F.**

	<b>Vacant Lots</b>	<b>% of Total</b>
<b>DISTRICT 1</b>	<b>410</b>	<b>15%</b>
<b>DISTRICT 2</b>	<b>617</b>	<b>22%</b>
<b>DISTRICT 3</b>	<b>978</b>	<b>35%</b>
<b>DISTRICT 4</b>	<b>328</b>	<b>12%</b>
<b>DISTRICT 5</b>	<b>227</b>	<b>8%</b>
<b>DISTRICT 6</b>	<b>85</b>	<b>3%</b>
<b>DISTRICT 7</b>	<b>19</b>	<b>1%</b>
<b>DISTRICT 8</b>	<b>94</b>	<b>3%</b>
	<b>2,808</b>	<b>100%</b>

Based on discussions with building officials and the Zoning Board Chairperson in Warwick, individual lots less than 3,000 s.f. were not considered because they could not realistically accommodate the construction of a house. Lots between 3,000 and 5,000 s.f. have in the past, been developed. However, it is believed that owners of lots less than 5,000 s.f. will have considerable difficulty in obtaining the necessary permits to build. Approximately 56 percent of the 2,808 individual vacant lots are less than 5,000 s.f. For this reason the total in Table 33 represents a worst case scenario.

Adjacent vacant, non-conforming lots in single ownership have the greatest potential for development and merit further study. It is unknown how many lots would be formed from the combination of sequential lots. In some instances 2 lots can be combined to form a legal lot, in

others 3 or more lots may be combined to form a single lot. A scenario resulting in the most lots would occur if all 1,450 lots were joined in groups of 2, resulting in 725 legal lots.

A review of each group of lots should be conducted to more accurately assess the residential in-fill capacity of the City.

**Table 34**  
**Vacant Sequential Lots in Common Ownership**

	<b>Lots</b>	<b>% of Total</b>
<b>DISTRICT 1</b>	<b>78</b>	<b>11%</b>
<b>DISTRICT 2</b>	<b>236</b>	<b>33%</b>
<b>DISTRICT 3</b>	<b>223</b>	<b>31%</b>
<b>DISTRICT 4</b>	<b>116</b>	<b>16%</b>
<b>DISTRICT 5</b>	<b>0</b>	<b>0%</b>
<b>DISTRICT 6</b>	<b>40</b>	<b>6%</b>
<b>DISTRICT 7</b>	<b>23</b>	<b>3%</b>
<b>DISTRICT 8</b>	<b>10</b>	<b>1%</b>
	<b>725</b>	<b>100%</b>

Districts 2 and 3 have the greatest potential for in-fill development with over 2,000 small vacant lots. This represents 58 percent of the City's capacity for in-fill development. Districts 1 and 4 combined contain 27 percent of the small vacant lots. Ten percent of the lots are found in districts 5 and 6, and the remaining 4 percent are in districts 7 and 8. Table 35 illustrates the distribution of small vacant lots in Warwick.

**Table 35**  
**Total Vacant Non-Conforming Lots**

	<b>Lots</b>	<b>% of Total</b>
<b>DISTRICT 1</b>	<b>488</b>	<b>14%</b>
<b>DISTRICT 2</b>	<b>853</b>	<b>24%</b>
<b>DISTRICT 3</b>	<b>1201</b>	<b>34%</b>
<b>DISTRICT 4</b>	<b>444</b>	<b>13%</b>
<b>DISTRICT 5</b>	<b>227</b>	<b>6%</b>
<b>DISTRICT 6</b>	<b>125</b>	<b>4%</b>
<b>DISTRICT 7</b>	<b>42</b>	<b>1%</b>
<b>DISTRICT 8</b>	<b>104</b>	<b>3%</b>
	<b>3,533</b>	<b>100%</b>

Table 36 is a compilation of all the different types of undeveloped residential land in Warwick. The graphic representation of this table, the previous figure, shows the districts with the most overall development potential. Districts 2 and 3 have the greatest overall potential for residential development, with 3,492 lots or, 37 percent of the total. The majority of the lots in these two districts are in the vacant non-conforming category, 51 and 67 percent respectively. District 7 has the greatest potential for subdivision development with 1,187 lots from under developed parcels, and has 17 percent of all lots in the buildout analysis, 1,590. Undeveloped lots in Districts 6 & 7 in the western part of the City contain 48 percent of the lots cut from underdeveloped parcels and about 20 percent of all lots in the buildout. The cost of providing services for development in these two areas would be greater because the infrastructure has not been developed to the extent it has in other districts.

A brief description of the 8 districts and a summary of each district's lot distribution is contained in the next section. The following figure is a map of Warwick showing the 8 planning districts, and the concentration of available lots by district.

### **District 1**

District 1 incorporates the neighborhoods of Pawtuxet, Lakewood, Spring Green, Governor Francis and Gaspee Plateau. Within these neighborhoods, there are approximately 431 buildable lots that are greater than 7,000 square feet. This represents 11 percent of the citywide total of under developed buildable lots. Most of these lots are concentrated within A-10 and A-7 zones. The 421 vacant conforming lots in this district represent approximately twenty percent of all vacant



**Table 36**  
**Undeveloped Residential Land by District**

	A-7	A-10	A-15	A-40	All Zones	%
<b>DISTRICT 1</b>						
Vacant Conforming	273	141	0	7	421	31%
Vacant Non-conforming	465	11	4	8	488	36%
Under Developed	169	251	0	11	431	32%
<b>TOTAL LOTS</b>	<b>898</b>	<b>403</b>	<b>4</b>	<b>26</b>	<b>1331</b>	<b>14%</b>
<b>DISTRICT 2</b>						
Vacant Conforming	169	125	0	2	296	18%
Vacant Non-conforming	542	47	0	264	853	51%
Under Developed	177	360	0	0	537	32%
<b>TOTAL LOTS</b>	<b>1199</b>	<b>532</b>	<b>0</b>	<b>2</b>	<b>1686</b>	<b>18%</b>
<b>DISTRICT 3</b>						
Vacant Conforming	249	0	0	79	328	18%
Vacant Non-conforming	951	194	13	43	1201	67%
Under Developed	9	105	0	163	277	15%
<b>TOTAL LOTS</b>	<b>1459</b>	<b>299</b>	<b>13</b>	<b>285</b>	<b>1806</b>	<b>19%</b>
<b>DISTRICT 4</b>						
Vacant Conforming	165	70	12	25	272	23%
Vacant Non-conforming	300	10	39	95	444	37%
Under Developed	129	265	85	5	484	40%
<b>TOTAL LOTS</b>	<b>594</b>	<b>345</b>	<b>136</b>	<b>25</b>	<b>1200</b>	<b>13%</b>
<b>DISTRICT 5</b>						
Vacant Conforming	72	0	0	0	72	23%
Vacant Non-conforming	227	0	0	0	227	72%
Under Developed	16	0	0	0	16	5%
<b>TOTAL LOTS</b>	<b>315</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>315</b>	<b>3%</b>

<b>DISTRICT 6</b>						
<b>Vacant Conforming</b>	<b>156</b>	<b>132</b>	<b>4</b>	<b>0</b>	<b>292</b>	<b>27%</b>
<b>Vacant Non-conforming</b>	<b>117</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>125</b>	<b>11%</b>
<b>Under Developed</b>	<b>86</b>	<b>80</b>	<b>428</b>	<b>84</b>	<b>678</b>	<b>62%</b>
<b>TOTAL LOTS</b>	<b>359</b>	<b>219</b>	<b>433</b>	<b>84</b>	<b>1095</b>	<b>12%</b>
<b>DISTRICT 7</b>						
<b>Vacant Conforming</b>	<b>53</b>	<b>130</b>	<b>141</b>	<b>36</b>	<b>361</b>	<b>23%</b>
<b>Vacant Non-conforming</b>	<b>23</b>	<b>1</b>	<b>9</b>	<b>9</b>	<b>42</b>	<b>3%</b>
<b>Under Developed</b>	<b>0</b>	<b>163</b>	<b>601</b>	<b>423</b>	<b>1187</b>	<b>75%</b>
<b>TOTAL LOTS</b>	<b>76</b>	<b>294</b>	<b>751</b>	<b>468</b>	<b>1589</b>	<b>17%</b>
<b>DISTRICT 8</b>						
<b>Vacant Conforming</b>	<b>27</b>	<b>38</b>	<b>0</b>	<b>3</b>	<b>68</b>	<b>15%</b>
<b>Vacant Non-conforming</b>	<b>104</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>104</b>	<b>23%</b>
<b>Under Developed</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>273</b>	<b>283</b>	<b>62%</b>
<b>TOTAL LOTS</b>	<b>131</b>	<b>48</b>	<b>0</b>	<b>276</b>	<b>455</b>	<b>5%</b>
<b>ALL DISTRICTS</b>						
<b>Vacant Conforming</b>	<b>1164</b>	<b>638</b>	<b>157</b>	<b>152</b>	<b>2109</b>	<b>22%</b>
<b>Vacant Non-conforming</b>	<b>2729</b>	<b>270</b>	<b>66</b>	<b>419</b>	<b>3484</b>	<b>37%</b>
<b>Under Developed</b>	<b>586</b>	<b>1234</b>	<b>1114</b>	<b>959</b>	<b>3893</b>	<b>41%</b>
<b>TOTAL LOTS</b>	<b>5234</b>	<b>2140</b>	<b>1271</b>	<b>1111</b>	<b>9486</b>	

Conforming lots in the City, and are found predominantly in A-10 and A-7 zones. The greatest number of lots in this district, 488, are vacant non-conforming. The area is generally characterized by small lots and older homes. In fact, this neighborhood contains some of the oldest settlements in Warwick.

## District 2

District 2 incorporates the neighborhoods of Greylawn, Hoxsie, Conimicut, Meadowbrook and Old Warwick. There are approximately 853 vacant non-conforming lots representing 24 percent of the Citywide total. Underdeveloped buildable lots, totaling 537 represent 14 percent of the City's total in this category. For the most part, both the under developed and vacant lots are concentrated in the A-10 and A-7 zones. As in District 1, these neighborhoods are also

characterized by older homes built on smaller lots.

### **District 3**

District 3 incorporates the neighborhoods of Long Meadow, Warwick Neck, and Oakland Beach. These neighborhoods have approximately 277 underdeveloped lots that are greater than 7,000 square feet representing only 7 percent of the citywide total, or the second smallest number in the entire City. However, there are approximately 1,529 vacant lots that can be developed within these neighborhoods. Approximately 1,200 of these are non-conforming lots. The distribution of lots are divided within three districts A-7, A-10 and A-40. It is likely that the small lots including A-10 and A-7 lots are concentrated in Oakland Beach while the 160 A-40 lots are scattered through Warwick Neck. The neighborhoods are fairly diverse in that Oakland Beach is characterized by smaller house lots which includes many homes which were built as summer houses while Warwick Neck developed as a much later suburban community with one acre zoning.

### **District 4**

District 4 incorporates the neighborhoods of Greenwood East, Wildes Corner, Buttonwoods, Apponaug, Nausauket, and Arnolds Neck. This rather large cluster of neighborhoods has about 484 under developed lots that are greater than 7,000 square feet and 716 vacant parcels that can be developed. As in Districts 1 and 2, this one is also concentrated in the A-7 and A-10 zones.

### **District 5**

District 5 incorporates the neighborhoods of Hillsgrove and Norwood. While geographically large, this neighborhood has the smallest population because it is occupied by T.F. Green State Airport, which takes up over 1,000 acres of land. There are 299 vacant lots most of which are vacant non-conforming lots located in the plats north of the airport. Under developed lots represent less than 1 percent of the citywide total.

### **District 6**

District 6 incorporates the neighborhoods of Greenwood, Pontiac and Natick. These neighborhoods include 678 underdeveloped parcels and 417 vacant lots. This is the second largest of concentration of buildable lots representing 17 percent of the citywide total. While most of the lots appear to be concentrated in the A-10 and -15 zones there are a fair number within A-7 and A-40.

**District 7**

District 7 incorporates the neighborhoods of Cowesett and Bald Hill. This area is the fastest growing section of Warwick and represents the largest number of vacant parcels as well as underdeveloped buildable lots greater than 7,000 square feet. There are approximately 1,187 such buildable lots with the largest number in the A-15 zone followed by substantial parcels in the A-40 zones. Many of these parcels are existing farms and large estates that are subject to subdivision and tract development.

**District 8**

District 8 incorporates the neighborhood of Potowomut. This area has only 283 underdeveloped buildable lots and almost all of these are zoned A-40. In addition there are approximately 172 vacant lots that can be developed in this neighborhood and they are scattered within the A-7 and A-10 zones.

The City has a buildout capacity of 9,485 lots within the four zoning districts. In order to estimate when the City will reach buildout, it will be necessary to determine how many lots might be developed in future years based on historical building trends. Since 1980, an average of 326 permits for new units per year have been granted. While there may not be a one-to-one correlation between the number of building permits issued and the number of building lots cut, there is a strong enough relationship to warrant using the 326 per year figure as the base rate at which building lots will be developed in the near future.

Forty-one percent of the lots in the buildout are in the under developed or vacant large lot category. The bulk of these lots, 48 percent, are in districts 6 and 7 in the western part of the City. If the trend of the last ten years continues, much of the City's residential development will take place on large parcels that will require the construction of subdivision roads for access.<sup>361</sup> Many of the parcels included in this buildout may have constraints both natural and man-made, beyond those which are identified here. For this reason a percentage of the lots listed may never be developed. However, the resourcefulness of developers in finding ways to utilize every available acre should also be factored in. Districts 2 and 3 have the greatest capacity for in-fill development. Development of a large portion these lots could have a significant impact on the City's ability to provide services. The capacity of some of the City's services in these two districts may be sufficient to handle the increase in population caused by the development of these in-fill lots. Other types of services may already be over taxed by current population levels and may require costly capital improvements to accommodate the influx of new residents.

Demographers have adopted a theory used by biologists to explain reduced rates of population increase as the carrying capacity of the environment is reached. Warwick's carrying capacity will be reached when resources necessary for further growth are depleted. Developable land in this case, is the non-renewable resource that will determine the City's carrying capacity. Given a set-zoning configuration there is a maximum number of lots which can be developed. As the carrying capacity of the land is reached competition for buildable land will force people to look else where for house lots thus reducing the number of lots developed per year. Also the land remaining as carrying capacity is reached will be the least desirable land for development because of environmental constraints. Obtaining the necessary permits to develop marginal land will increase the time necessary to develop parcels with constraints, and will ultimately protract the time it takes to reach buildout.

Given the amount of developable land that remains and the amount that has been developed it would appear that the City is in the upper reaches of buildout. The development rate curve that, depicts the number of lots developed over time should begin to resemble the declining curve in the following figure.

The result of a reduction in the number of lots developed each year should result in decreasing rate of population growth. The reduced rate of development will serve to protract the time it takes to reach buildout. For the purposes of this study, the number of lots developed will be broken into 10-year increments. The number of lots developed per year will be decreased by a larger percentage in each decade. A 10 percent reduction in the number of lots developed in the first decade will be assumed. The development rate for the fifth decade will be 79 lots per year or 24 percent of the original rate of 326 lots per year. Factors such as the economy, technology and environmental regulation will effect the development rate, and no amount of historical analysis will enable an accurate depiction of the rate at which development will occur in the future. In any given decade in the future there are likely to be peaks and valleys in the economy, which will effect the development rate. The 1980's are a good example of how swings in the economy effect the rate at which development occurs. The recession economy of the early 1980's saw an average 254 units built per year, while an average 415 units a year were built in the second half of the decade which was characterized as a boom economy.

The table below illustrates the outcome of using a stepped development rate. Buildout capacity, 9,486 lots should be reached by the year 2037 assuming the current zoning configuration remains, and the rate of development decreases with time.

**Table 37**  
**Results of Stepped Development Rate Method**

<b>Year</b>	<b>Lots/Year</b>		<b>Time Period</b>	<b>Lots</b>
<b>1980-88</b>	<b>326</b>	<b>x</b>	<b>9 yr.=</b>	<b>2,934</b>
<b>2000</b>	<b>326 - 10% = 293</b>	<b>x</b>	<b>10 yr.=</b>	<b>2,935</b>
<b>2010</b>	<b>326 - 15% = 249</b>	<b>x</b>	<b>10 yr.=</b>	<b>2,494</b>
<b>2020</b>	<b>326 - 22% = 205</b>	<b>x</b>	<b>10 yr.=</b>	<b>2,052</b>
<b>2030</b>	<b>326 - 30% = 144</b>	<b>x</b>	<b>10 yr.=</b>	<b>1,436</b>
<b>2037</b>	<b>326 - 45% = 79</b>	<b>x</b>	<b>7.2 yr.=</b>	<b>569</b>
				<b>9,486</b>

The following table shows the assumed distribution of lots by planning district for each decade through buildout in the year 2037. The number of lots assigned to a district in any decade is based on the percentage of total lots in that district and the number of lots developed in that decade. For instance, District 1 represents 14 percent of the buildout capacity or 1,340 lots. By the year 2000, 415 lots (14 percent of 2,934 lots in the first decade) will have been developed.

**Table 38**  
**Distribution of Lots by Planning District**

<b>DISTRICTS</b>								
<b>YEAR</b>	<b>1-(14%)</b>	<b>2-(18%)</b>	<b>3-(19%)</b>	<b>4-(13%)</b>	<b>5-(3%)</b>	<b>6-(12%)</b>	<b>7-(17%)</b>	<b>8-(5%)</b>
<b>2000</b>	<b>415</b>	<b>522</b>	<b>559</b>	<b>371</b>	<b>97</b>	<b>338</b>	<b>492</b>	<b>141</b>
<b>2010</b>	<b>352</b>	<b>443</b>	<b>475</b>	<b>316</b>	<b>83</b>	<b>288</b>	<b>418</b>	<b>120</b>
<b>2020</b>	<b>290</b>	<b>365</b>	<b>391</b>	<b>260</b>	<b>68</b>	<b>237</b>	<b>344</b>	<b>98</b>
<b>2030</b>	<b>203</b>	<b>255</b>	<b>273</b>	<b>182</b>	<b>48</b>	<b>166</b>	<b>241</b>	<b>69</b>
<b>2037</b>	<b>80</b>	<b>101</b>	<b>108</b>	<b>72</b>	<b>19</b>	<b>66</b>	<b>95</b>	<b>27</b>
<b>9,486</b>	<b>1340</b>	<b>1686</b>	<b>1806</b>	<b>1200</b>	<b>315</b>	<b>1094</b>	<b>1590</b>	<b>455</b>

In Warwick there are two types of residential development occurring, subdivision development involving division of relatively large parcels of land, and in-fill development occurring on vacant lots that had been previously cut from larger parcels. Much of Warwick's development in the past ten years has been subdivision development. The depressed housing market which currently persists will likely slow the rate of subdivision development, and may shift the emphasis to in-fill development. Desire to be part of a particular neighborhood created the impetus for

development of vacant lots in some areas of Warwick. There has been a steady stream of requests for zoning variances that would enable landowners to develop substandard lots. When housing markets rebound subdivision activity will again make up a higher percentage of the lots developed in year. At some point all large parcels capable of being subdivided will be developed, leaving only single vacant in-fill lots to be developed.

### Population

Using figures from the buildout analysis it is possible to estimate the population of the City. Statewide projections for persons per household were multiplied by the projected number of lots to be developed in a district in a ten-year period resulting in the population increase for that decade.<sup>37</sup> A constant person per household figure of 2.3 was assumed beyond the year 2010. The median yearly figure for natural increase over the last 9 years was 133 people. An adjusted figure for natural increase was added to the total increase column in the table below.<sup>38</sup>

### Commercial and Industrial Land

The Land Use Plan: 1986-1991 identifies 197 acres of commercial land and 461 acres of industrial land that are suitable for commercial development in the City of Warwick. Figures used in this plan were derived from the City of Warwick Inventory of Vacant Commercially and Industrially Zoned Land, 1985.

**Table 39**  
**Population Increase Based on Buildout**

									<b>TOTAL</b>
<b>YEAR</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>INCREASE</b>
<b>2000</b>	<b>995</b>	<b>1252</b>	<b>1341</b>	<b>891</b>	<b>234</b>	<b>812</b>	<b>1180</b>	<b>338</b>	<b>8,383</b>
<b>2010</b>	<b>810</b>	<b>1020</b>	<b>1092</b>	<b>726</b>	<b>191</b>	<b>662</b>	<b>962</b>	<b>275</b>	<b>7,076</b>
<b>2020</b>	<b>667</b>	<b>839</b>	<b>899</b>	<b>597</b>	<b>157</b>	<b>544</b>	<b>791</b>	<b>226</b>	<b>6,057</b>
<b>2030</b>	<b>467</b>	<b>587</b>	<b>629</b>	<b>418</b>	<b>110</b>	<b>381</b>	<b>554</b>	<b>158</b>	<b>4,638</b>
<b>2037</b>	<b>185</b>	<b>233</b>	<b>249</b>	<b>166</b>	<b>43</b>	<b>151</b>	<b>219</b>	<b>63</b>	<b>2,641</b>
	<b>3,123</b>	<b>3,930</b>	<b>4,210</b>	<b>2,797</b>	<b>734</b>	<b>2,550</b>	<b>3,706</b>	<b>1,061</b>	<b>28,795 - 2037</b>

### Household size

<b>1970</b>	<b>3.357</b>	<b>1970 Census Warwick</b>
<b>1980</b>	<b>2.814</b>	<b>1980 Census Warwick</b>
<b>1990</b>	<b>2.5</b>	<b>State-wide Projections</b>
<b>2000</b>	<b>2.4</b>	<b>State-wide Projections</b>
<b>2010</b>	<b>2.32</b>	<b>State-wide Projections</b>
<b>2020</b>	<b>2.32</b>	<b>Constant</b>
<b>2030</b>	<b>2.32</b>	<b>Constant</b>

Warwick planning department staff identified parcels that had been developed subsequent to the 1985 inventory. Of the 219 acres of commercial land in the City approximately 103 acres remain undeveloped. Twenty three percent of this land is in the Office zone and 78 percent is zoned General Business. Since 1985, 116 acres of commercial land has been developed in some way. Commercial land, in the past 5.8 years has been developed at a rate of 20 acres a year, suggesting a much slower absorption rate than was forecasted in the Land Use Plan: 1986-1991. Historical trends showed on average that 38 acres of commercial land was being developed each year.<sup>39</sup> The City will not have a short fall of commercial land by 1992 as was indicated in this plan. Using the updated 5-year average of 17.1 acres/year, Warwick's commercial land will be developed by 1996. Table 40 and Figures 32 and 33 show the distribution of vacant commercial and industrial land by district. In addition to the 103 acres of developable commercial land in the City, there are approximately 15 acres of commercial land which is considered constrained for development because of the presence of wetlands or flood plain soils. It should be noted that this inventory does not take into account vacant floorspace in developed commercial land. In the Rt. 2 commercial corridor alone the amount of vacant commercial floorspace exceeds 284,000 square feet. While the presence of vacant developed commercial property will have some effect on absorption rates of vacant commercially zoned land, such impact will not substantially alter our projection since said vacant floorspace is not always so situated and available in the right quantity to attract a commercial operation that is contemplating building from scratch.

The Land Use Plan: 1986-1991 identifies 542 acres of vacant industrially zoned land in the City. In 1985 there were 542 acres of industrial land in the City. An estimated 144 acres of the 542 developable acres remain undeveloped. An additional 79 acres of vacant industrial land is considered to be un-developable because of the presence of floodplain soils or wetlands. Sixty-three percent of the developable land is in the Light Industrial zone and 37 percent is zoned for



**Table 40**  
**Vacant Commercial & Industrial Land**

	<b>O</b>	<b>GB</b>	<b>LI</b>	<b>GI</b>	<b>Wet</b>
<b>DISTRICT 1</b>	<b>0</b>	<b>14.4</b>	<b>16.5</b>	<b>0</b>	<b>10.5</b>
<b>DISTRICT 2</b>	<b>0</b>	<b>5.1</b>	<b>0</b>	<b>0</b>	<b>0.6</b>
<b>DISTRICT 3</b>	<b>0</b>	<b>14.4</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>DISTRICT 4</b>	<b>0</b>	<b>12.2</b>	<b>34.0</b>	<b>0</b>	<b>9.8</b>
<b>DISTRICT 5</b>	<b>9.8</b>	<b>6.2</b>	<b>17.0</b>	<b>8.2</b>	<b>31.8</b>
<b>DISTRICT 6</b>	<b>0</b>	<b>11.8</b>	<b>13.1</b>	<b>45.5</b>	<b>49.2</b>
<b>DISTRICT 7</b>	<b>13.8</b>	<b>15.6</b>	<b>9.52</b>	<b>0</b>	<b>2.0</b>
<b>DISTRICT 8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTALS</b>	<b>23.6</b>	<b>79.6</b>	<b>90.1</b>	<b>53.7</b>	<b>103.9</b>

O- (Office)

GB- (General Business)

LI- (Light Industrial)

GI- (General Industrial)

General Industry - Since 1985, 319 acres of industrial land has been developed in some way. Industrial land in the past 5.8 years, has been developed at a rate of almost 55 acres a year, suggesting a far greater absorption rate than was forecasted in the Land Use Plan: 1986-1991. Historical trends showed on average that 16.5 acres of industrial land were being added each year.<sup>40</sup> If the current rate of absorption continues all of Warwick's developable industrial land will be absorbed by the second quarter of 1993. Table 40 shows the distribution of vacant industrially zoned land in Warwick.

## Conclusions

A buildout analysis is based on various assumptions; the most significant of which is that the current zoning configuration will remain unchanged. While changes in zoning do not happen frequently, they are part of the normal evolution of any growing community. Changes in attitude toward development may occur over time and new information regarding the impacts of development on natural systems make shifts in zoning density necessary. Recent changes in zoning along Warwick's coastline are an example of how environmental concerns can impact zoning. Given the public's concern over environmental issues it is not likely that low-density areas of the City will be zoned for higher density. As the buildout figures indicate Warwick has

significant in-fill capacity. Changes to higher density zoning should not be necessary for many years.

However, shortages of usable commercial and industrial land may necessitate changes in zoning which lead to a reduction in residential land in certain areas. Further study is necessary to determine where zoning might be changed to accommodate Warwick's growing non-residential sectors. There are residential areas along Jefferson Boulevard that could be rezoned to allow for further commercial or industrial growth with a minimum amount of disturbance to surrounding neighborhoods. Other opportunities for industrial and commercial growth exist in Districts 6 and 7 along Route 95.

### **Goals and Policies**

The City recently undertook a series of zoning amendments to bring its ordinance up to date and to effectuate several land use changes. Most notable of these changes was the reduction in housing densities along the coastline to reduce the pressures on water quality. Now with the benefit of a buildout analysis, the City must consider further changes in its zoning maps.

#### **Policy 1**

- Reduce the number of buildable undersized lots by requiring mergers of parcels where possible to comply with existing zoning.

#### **Policy 2**

- Rezone certain large underdeveloped or undeveloped tracts of land to Industrial (I). Selection of tracts to be based on proximity to regional transportation corridors, availability of necessary infrastructure, environmental constraints, and compatibility with surrounding land uses. Said rezoning shall be undertaken as part of a larger overhaul of the City Zoning Ordinance being conducted to meet changes in state enabling legislation.
- New industrial zones should be contiguous with existing industrial areas, wherever possible.
- New industrial zones should be used as buffer zones around T.F. Green State Airport.
- New commercial zones should be aimed primarily at the office market rather than retail.

#### **Policy 3**

- Existing vacant lots in residential zones should be closely monitored by the Department of City Plan.
- The Planning Department should review divisions of land involving substandard lots. A Planning Department review stamp could be used in the clerk's office to call attention to the formation of any substandard lots.
- The Zoning Board of Review should require side yard and set back requirements except when topographic conditions create a hardship.

**Policy 4**

- Multi-family residential uses should continue to be permitted through the current system of overlay zones requiring City Council action.
- Multi-family housing should be restricted to sewerage areas.

**Policy 5**

- Continue enforcement of the 1988-zoning ordinance.

**Policy 6**

- Protect, preserve and enhance residential neighborhoods and environmentally sensitive areas, through open space acquisition and through sensitive siting of competing land uses.
- In some instances, different land uses can successfully co-exist in close proximity, a fact already recognized by the City's zoning ordinance (i.e. the PUD classification). As a mature suburban community with rapidly dwindling reserves of developable land the challenge will be to rationally accommodate and integrate new industrial, commercial, residential and other uses through carefully considered rezoning. Such rezoning should seek to maximize the benefits of integration (i.e., proximity to employment and services for residents) while mitigating potential liabilities (i.e., traffic, noise, and environmental impacts).
- Encourage and promote desirable land use practices including, but not limited to:
  - a. Limiting the issuance of use and standards variances.
  - b. Preservation of public rights-of-way, especially where they provide access to fresh or saltwater bodies.
  - c. Promotion of cluster development as a means of open space preservation.
  - d. Low density development in sensitive coastal and wetland areas.
  - e. Tree preservation.
  - f. Preservation of agricultural uses.
  - g. Stimulate and provide new policy directions and land use control techniques.

**Policy 7**

- Link development to the provision of public infrastructure and services. Establish an annual development cap that would allow only that amount of development that can be accommodated by planned expansions in public infrastructure/services in a given year. Said cap would limit the total amount of new building square footage developed in a given year.

The use of annual development caps enables local governments to provide necessary infrastructure to unimproved land prior to its development. Infrastructure and services required by new development -- such as roads, sewers, schools, and police and fire service - place a financial burden on local government. Annual development caps have become a well-established tool to manage growth, which has been used by numerous communities.

The Town of Petaluma, California implemented a cap on development allowed within town boundaries in 1973. Boulder, Colorado used Petaluma's regulation as a model in 1977, when it also enacted an ordinance to limit the number of new dwelling units permitted each year.

Montgomery County, Maryland has been setting annual limits on development since 1986.

The County identifies areas in which public facilities are not available, and places a moratorium on such areas. Moratoria are lifted at a certain rate per year, based on public improvements. In 1991, the County won two lawsuits that had challenged the moratorium, asserting that it amounted to a taking of the economic value of the property.

A Supreme Court ruling on Nollan versus South Carolina Coastal Commission has helped to set a national standard for determining when land use regulations are liable to be considered "takings" under the Fifth Amendment of the U.S. Constitution. In the Nollan case, the Supreme Court ruled that restrictions to use of property must be directly linked to the project at hand. In the case of capping annual development, there is a clear and quantifiable relationship between the amount of new development and the amount of public infrastructure and services required by such development.

**Policy 8**

- Examine the potential to add new historic area districts in Apponaug and Pontiac.

**Policy 9**

- Encourage neighborhood preservation and revitalization efforts through local commercial district revitalization with the use of Community Development Block Grant (CDBG) funds such as the Conimicut Village project.

## **Footnotes**

- <sup>1</sup> I. Michael Heyman, The New Zoning: Administrative and Economic Concepts and Techniques, eds. Marilyn W. Groves and Norman Marcus, (New York: Praeger Publishers, 1970), page 61.
- <sup>2</sup> Martin Myerson, "Building in Middle-Range Bridge for Comprehensive Planning", in A Reader in Planning Theory, ed. Andreas Faludi (New York: Pergamon Press, 1973), Page 134.
- <sup>3</sup> City of Warwick, Department of City Plan, 1990 Land Use Plan, Warwick, R.I., draft, (City of Warwick, R.I. 1976): City of Warwick, Department of City Plan Zoning Interim Report (City of Warwick, R.I. 1971).
- <sup>4</sup> For an excellent review of Warwick's colonial beginnings, please refer to the "Standard Historical Preservation Report", K-W-1, Warwick, R.I. , 1981.
- <sup>5</sup> Note that West Warwick was still part of Warwick until 1913.
- <sup>6</sup> 1960 and 1970 U.S. Census
- <sup>7</sup> 1970 and 1980 U.S. Census
- <sup>8</sup> City of Warwick, Building Department, compiled by the Department of City Plan.
- <sup>9</sup> Ibid.
- <sup>10</sup> 1970 U.S. Census
- <sup>11</sup> 1980 U.S. Census
- <sup>12</sup> City of Warwick, Department of City Plan
- <sup>13</sup> 1950, 1960 and 1970 U.S. Census
- <sup>14</sup> U.S. Bureau of the Census, 1910-1980
- <sup>15</sup> City of Warwick, Department of City Plan, 1990 Land Use Plan, Warwick, RI, February 1976, draft page 20.
- <sup>16</sup> 1950 U.S. Census
- <sup>17</sup> 1970 U.S. Census
- <sup>18</sup> Projection of population based on buildout of available residentially zoned land. Projections assume an average household size of 2.4 persons. Actual counts for 1970, 1980 and 1990 are from the U.S. Census of Population.
- <sup>19</sup> City of Warwick, Building Department, compiled by the Department of City Plan
- <sup>20</sup> Ibid
- <sup>21</sup> The basic resource for this section is Dr. John Kupa's' The Wetlands of Warwick, Rhode Island: An Ecological Analysis and Evaluation, Ecological Associates, Inc., North Kingstown, R.I., 1973.
- <sup>22</sup> Ibid. Page 16

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- 23 Dr. John J. Kupa, The Wetlands of Warwick, Rhode Island, An Ecological Analysis and Evaluation, Ecological Associates, Inc., North Kingstown, R.I., Page a.
- 24 City of Warwick, Rhode Island Zoning Ordinance, 1982, Page 1050.
- 25 A Guide to Land Resource Permits, R.I. Department of Environmental Management, Page 4.
- 26 The State of Rhode Island, Coastal Resources Management Program, 1983, Page 54.
- 27 City of Warwick, Department of City Plan, Warwick City Coast Plan, draft, 1984.
- 28 Ibid, page II-18.
- 29 Ibid, page II-19.
- 30 Rhode Island Department of Statewide Planning, 208 Water Quality Management Plan for Rhode Island, March 1979, (Providence, Rhode Island), Page 95.
- 31 Projections, RI Department of Administration, Division of Planning, Report number 64. 2000 - 2.4 interpolated from 1986 projection, 2010 - 2.32 projected.
- 32  $133 \text{ people/yr.} \times 10 \text{ years} = \text{ten year natural increase} + (\text{natural increase/thousand population} \times \text{increase in population due to migration})$ .
- 33 The average number of units razed for a five-year period, 1981 - 1985, was 11.4. It was assumed that this average would remain constant between 1990 and 2010.  $11.4 \times 10 \text{ years} = 114$ .
- 34 The 1990 U.S. Census vacancy rate for Warwick was 4.8%.  $4.8\% \times 6,542 = 314$ .
- 35 The Economic and Fiscal Trend study documented a total commercial employment increase (four sectors) of 4,179 employees between 1980-85 (6 years). Over a five-year period (1987-1991), the increase would be 3,483 employees.
- 36 Warwick Department of City Plan, Staff phone conversation 10/17/90.
- 37 Projections, RI Dept. of Administration, Division of Planning, Report number 64. 1990- 2.5 intertpelated from 1986 projection, 2000- 2.4 interpletated, 2010- 2.32 projected.
- 38  $133 \text{ people/yr} \times 10 \text{ yr} = \text{ten year natural increase} + (\text{natural increase/thousand population} \times \text{increase in population due to migration})$ .
- 39 City of Warwick, Land Use Plan: 1986-1991
- 40 City of Warwick, Land Use Plan: 1986-1991
-